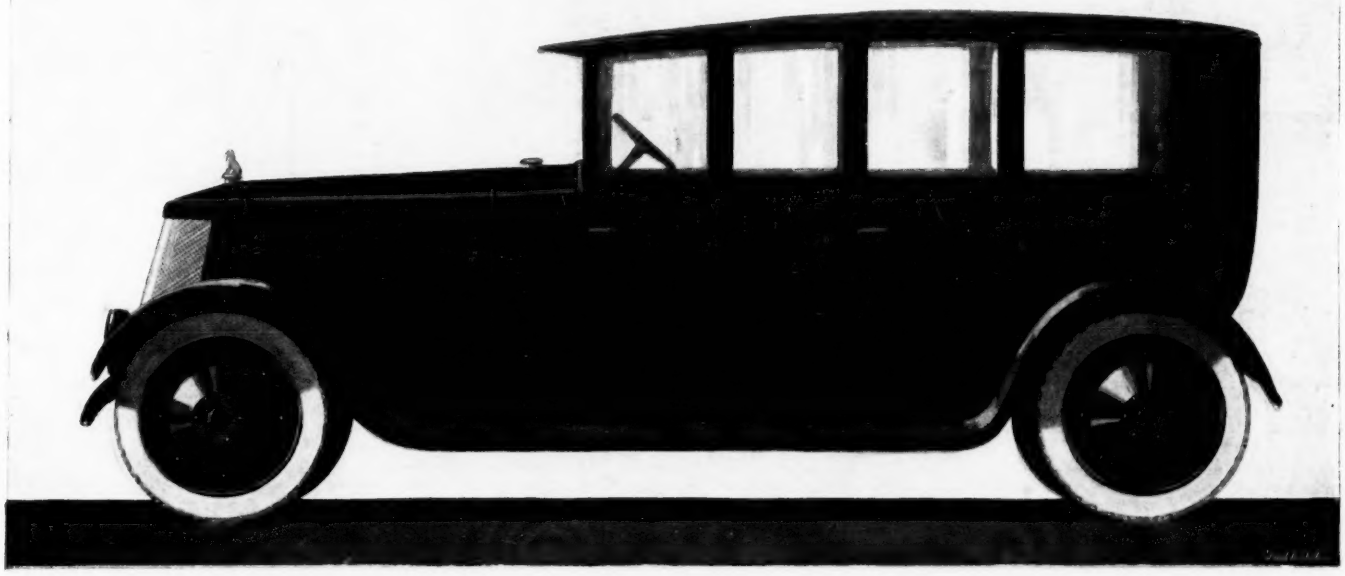
THE OLYMPIA AUTOMOBILE EXHIBITION
SPECIAL SUPPLEMENT, 1919

The ARMSTRONG SIDDELEY Six Cylinder Car

R.A.C. Rating 29·5 H.P. Treasury Tax £88 0.



THE new Armstrong-Siddeley 6-cylinder Car is of entirely original design, and embodies the experience gained during the past four years in the production of aircraft engines aggregating over 2,000,000 (two million) horse-power.

You cannot buy a better car.

It is a motor-carriage of high efficiency, stately appearance and ample power—constructed of the best materials.

It is light. It is comfortable. It is dependable. It runs smoothly, silently, and is easily managed. Maintenance costs are small. The low price at which it is sold is due to its simple design and to quantity production.

PRICE of CHASSIS EQUIPPED WITH Lucas Engine Starter and Electric Lighting complete with 5 Lamps, 4 Wheels and Spare Rim, 4 Tyres, Stepboards, all Wings and Dashboard. £720

Saloon Double Phaeton (as illustrated) - - - - £1000.

ARMSTRONG - SIDDELEY MOTORS LIMITED COVENTRY

(Formerly The Siddeley-Deasy Motor Car Co., Ltd.),
Allied with Sir W. G. Armstrong Whitworth & Co., Ltd.

LONDON: 10, Old Bond Street, W. 1

You cannot buy a better car

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STAND 262 OLYMPIA

C·A·V THE LEADING BRITISH HOUSE for everything electrical in connection with motoring

C. A. VANDERVELL & Co Ltd Electrical Engineers. ACTON, LONDON. W.3.

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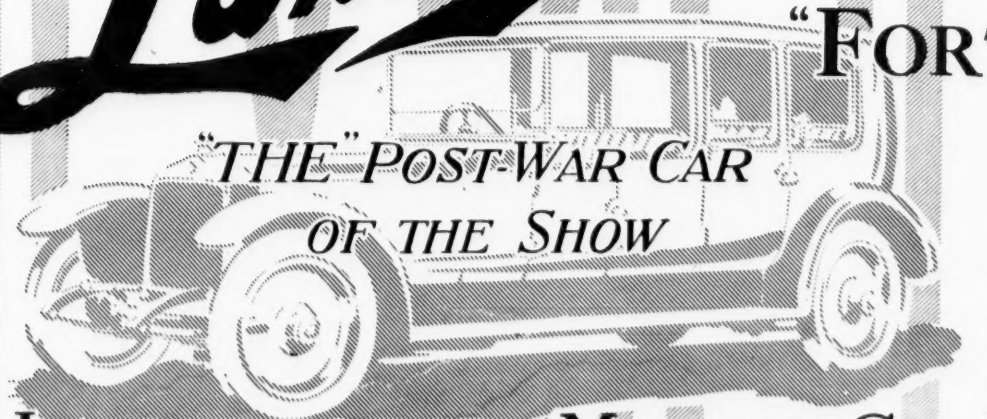
THE Lanchester NEW "FORTY"

"THE" POST-WAR CAR OF THE SHOW



THE LANCHESTER MOTOR CO., LTD

Armourer Mills Birmingham

95 New Bond Street London, W.

88 Deansgate Manchester

IN many ways the Thirteenth Olympia Motor Show, promoted by the Society of Motor Manufacturers and Traders, which opened its doors to the public yesterday, is the most difficult of the whole series for the writer on automobile topics to deal with adequately at so early a stage. It is the first to be held for six years—the last was in November of 1913—and the interval has, to a very large extent, represented so much lost time in the process of the development of the motor vehicle towards a state of ultimate perfection. Of course, the time has not been altogether lost, inasmuch as the war has taught very many and valuable lessons which will in time be applied to automobile practice; but the period since the conclusion of hostilities has been too short and conditions so unstable that it has not been possible so to apply the results of those lessons as to make it possible to say that a real and universal condition of marked progress in design has been manifested by the exhibits. Still, I think it is possible to say that every one of the old favourites, British and foreign, which are to be seen at Olympia, does show a considerable advance in detail over its predecessor of 1914; but it is nevertheless a fact that, generally speaking, the apparent differences are in most cases surprisingly small. I say advisedly the "apparent differences," because a very great deal of the progress which has been made is by way of improvement in the metals used, which in their turn have led to a marked lightening of the car. That is a point, however, which is not to be readily appreciated by the eye, and hence I say that improvement is, as a rule, much more real than apparent.

To my mind, the Show is really more interesting for what it promises in the future than for what it demonstrates at the immediate present. As I have said already, the bulk of the cars to be seen are really to be best described as the old models brought up-to-date and improved to the general point which would, in all probability, have been reached now had there been no war. Therefore, we ought, perhaps, to be fully satisfied with what there is to be seen; and no doubt we should be were it not that there is much in the Show which seems to prophesy something like a revolution in design when there has been time to effect it.

Directions of Change.

Let me endeavour to explain what I mean by this. We have heard a great deal about the influence of the aeroplane engine on car motor design, but the visitor to Olympia may well ask himself where the application of the lessons we are supposed to have learnt comes in. If he is a student and regards things carefully, he will see that aero-motor practice has been prolific in lessons, but that the application thereof is still to come—there has been no time properly to embody it in this year's designs. He will have visited such exhibits as those of Napier, Armstrong-Siddeley, Straker-Squire, and one or two others, and will there have seen engines which bear all the impress of their origin. They are true aero-motors, adapted to the purposes of car propulsion and modified to suit the conditions of road use. He will see that these motors have been lightened literally by hundred-weights compared with their pre-war forerunners. Instead of heavy cast-iron cylinder blocks, aluminium alloys are used, with steel liners as working cylinders. In place of the old L- or T-headed engine, with its valves disposed along the sides, he will see one with all its valves on top, driven by an overhead cam-shaft, giving the nearest possible approach to the ideal of straight draw-in and a straight blow-out of the induction and exhaust gases. He will find also that lubrication is on a far better plan than it was; and, when he has gone into the question of why, he will see that it is because of the lessons gathered in the running of aero-motors under the conditions of war service.

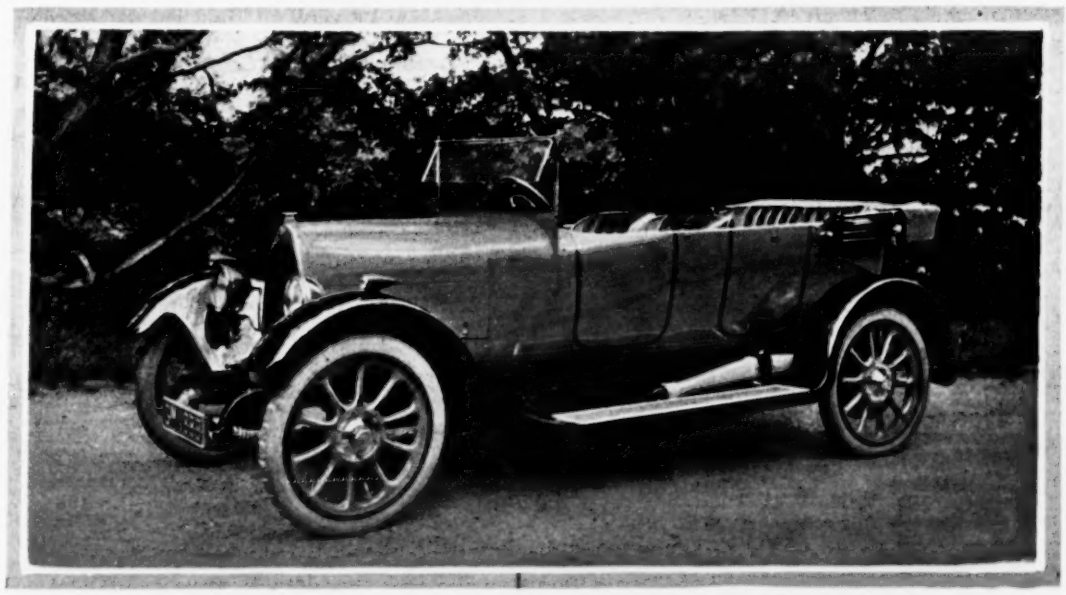
Again, when we come to details other than those of the motor we find that many of the war lessons have been applied to the great benefit of the car. Here, however, the improvements are not so readily to be seen, and in many cases they would escape notice altogether unless attention were drawn to them. The war was, of course, the most tremendous reliability trial for motor-vehicles imaginable; and even where both manufacturer and user were agreed that the car could not be bettered, the experiences of active service showed up weaknesses which had hitherto been unsuspected. For instance, within my own experience a very famous mark of British car invariably developed a serious weakness in the driving dogs of the rear wheels. This would, in all probability, never have manifested itself in ordinary usage, and it might thus be argued that it did not matter, anyhow. Still, I do not think it will be argued that the car is not a better vehicle now that this detail has been strengthened. Another almost equally famous vehicle had a habit of breaking the engine-brackets. I never heard of this happening before the war, and if it had only been a solitary instance which occurred, I should have put it down to unsuspected weaknesses of the metal. But it was not. Every one of these cars I had anything to do with suffered in the same way. Needless to say, this detail has been seen to, and I am perfectly confident that none of the new models will suffer from this particular weakness. These are only a couple of examples, culled from experience, but they might be multiplied almost indefinitely were there any need. As it is, I merely mention them to point the moral that the car of 1920 must, in the nature of things, be a vast improvement over that of 1914, even though improvement may not be instantly discernible.

A LANCHESTER SALOON: THE POST-WAR 40-H.P.

Progress in Equipment.

One direction in which great progress will be found is in the matter of equipment. The car of to-day is beyond question a far better turned-out vehicle, and more comfortable and convenient withal, than its predecessors. It seems to me that the British manufacturer has learnt his lesson, and learnt it well. Time was when it was a reproach levelled against him—and it must be conceded with justice—that the purchaser did not know within a hundred or so pounds what his car was going to cost him. He was sometimes quoted for chassis only, the choice of coach-builder and type of body being left to him entirely. Another time he was given a price for the car, *sans* hood, screen, tools, lamps, and the hundred-and-one fittings and accessories which are indispensable. Yet another maker listed his car with a portion of these fitments, but always there were necessaries to be purchased later out of one's own pocket. On the other hand, the American listed his car with all these things. You knew his price was an inclusive one, and that when you had paid for the car and taken delivery you had only to put petrol into the tank to be actually ready for a long tour.

To my mind, in this direction lies one of the most significant lessons of the present Show. We are right up to the Americans in this matter of equipment. The British car is listed now at a price which includes every essential fitting, and we know exactly what we have to pay. Another point in which the British maker has even surpassed the American is in the matter of equipping his car with engine-starting devices. I think I am right in saying that at the 1913 Show there was but one British car in which an electric starter was a standard fitting. In the present Show it would be difficult to find one in which it is not a standard. There may be such a one, but I have not come across it yet. Indeed, I am rather inclined to the opinion that makers have gone to the opposite extreme, and are fitting starters to small cars on which they are very much of an expensive luxury.



AS SHOWN ON STAND 48, AT OLYMPIA: THE FAMOUS "VICTORY" ARROL-JOHNSTON CAR.

Lanchester Changes.

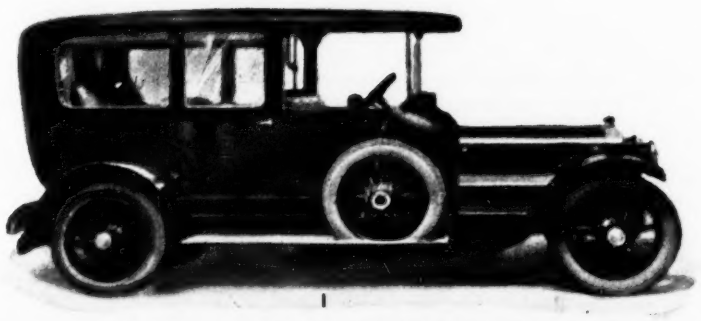
The new 40-h.p. Lanchester is rather a surprise to those who have followed the unconventional practice of the firm from the early days of automobilism

THE OLYMPIA Motor Show

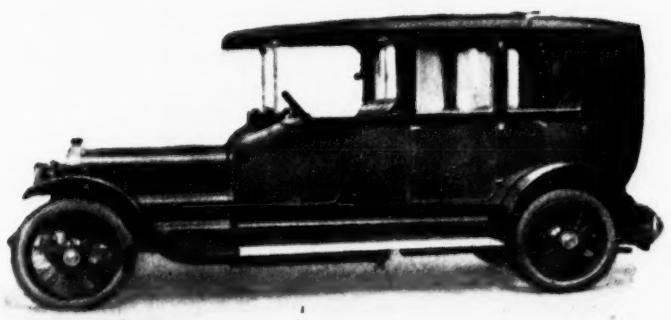
NOV. 7TH.–15TH. 1919.

—A triumph for the Daimler

STAND 75



The Daimler "Special" 45-h.p. 6 cylinders, fitted with the "Saltley" Limousine Body.



The Daimler "Standard Thirty" 30-h.p. 6 cylinders, fitted with the "Southfield" Landaulette Body.

THE DAIMLER NEW models have inspired the Connoisseurs of the motoring world to a chorus of congratulations and appreciation. It is a triumph for British motor engineering.

Quality not merely in outward finish—is the characteristic of the Daimler, coupled with the exclusive feature of the

DAIMLER SLEEVE VALVE ENGINE.

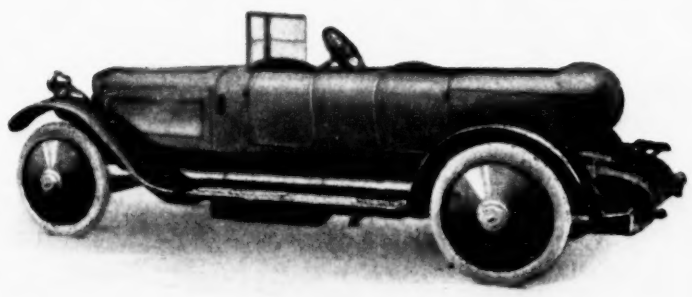
The "Special" and "Standard Thirty" provide a choice of two chassis for those requiring a commodious 7-seated Limousine or Landaulette Car. The "Lighty Thirty" is designed for the Owner-Driver, and is particularly suited for an open 4-seated Body or Coupé.

The "Light Thirty"

The Owner-Driver's Car.

Power, speed, silence, easy steering, perfect braking, a floating suspension, and the utmost reliability are the qualities which appeal to Owner-Drivers.

These Qualities are developed to the highest degree in the Daimler "Light Thirty."



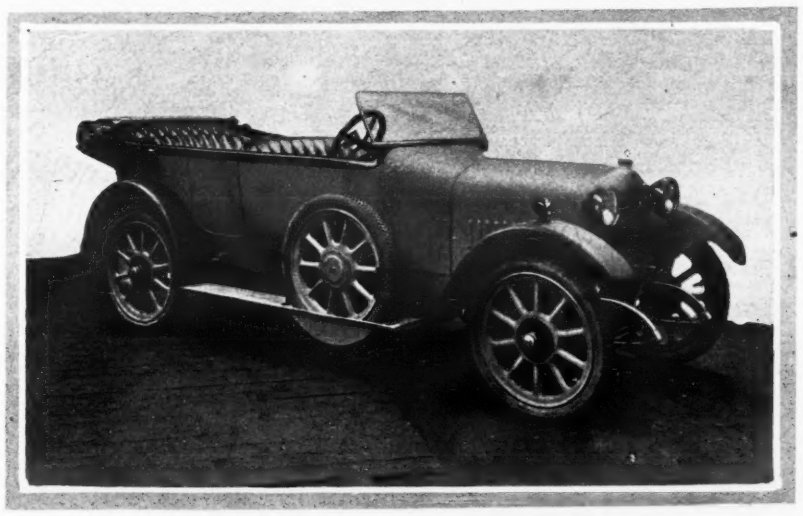
A Daimler "Light Thirty" 30-h.p. 6 cylinders, with a body by Grahame-White Company, Ltd.

The Daimler Company, Ltd., Coventry.

in England. From the start, Lanchesters have never hesitated to take their own line, and where they believed better efficiency was to be obtained by breaking away from what was regarded as accepted practice they have always done it. For example, for many years after the spray type of carburetter had become a standard fitting on every car, they adhered to the wick principle, in which the fuel is drawn up from a float-fed chamber through cotton wicks over which air passes on its way to the motor. It was bulky, and in very cold weather there was sometimes a little difficulty in starting; but it had many merits of its own. It was wonderfully economical of fuel—I have personally known of a 30-h.p. Lanchester landaulette which could be absolutely depended upon for thirty-two miles to the gallon when touring, and for twenty-five in London work, which would be regarded as quite phenomenal in the case of a car of the power and weight equipped with the conventional spray carburetter. There were many other differences of design between the Lanchester and other cars of similar class and quality which need not be touched upon here. It may not be out of place, however, to remark that Lanchesters pioneered the worm drive, which is now becoming almost universal on "quality" cars of all powers and sizes.

This new car, as I have said, marks several departures from previous practice. In the first place, it is the first Lanchester in which the conventional engine-under-the-bonnet design has figured, and, great respect as I have always had for Lanchester productions, I must say I like the appearance of the new car better than that of its predecessors of the mark. It may be conservatism or a worship of the conventions, but there it is: in my judgment the new car is a great improvement in so far as appearance is concerned. Then, at last, the wick carburetter has given place to one of the spray type; chiefly, I imagine, because the fitting of the older type would have been a matter of considerable difficulty in the altered design.

Many detail improvements have been made, doubtless as a result of war experience. We did not hear a great deal of Lanchesters during the five years of strife, though that was not because these fine cars were not doing their "bit" towards winning the great struggle. It is not, I believe, generally known that, with one exception, all the armoured cars which did such splendid work in Russia under Commdr. Locker-Lampson were Lanchesters. If anyone were inclined to question the ability of so refined a car to stand up to continual hard usage and abuse, the story of that two-and-a-half years' campaign, covering the whole Russian front from Archangel to the Persian frontier, supplies the answer. The exhibit consists of a complete car and chassis. Inspection of the latter shows that the motor is one of six cylinders of 38·4 R.A.C. rating, the cylinder dimensions being 4-in. bore by 5-in. stroke. The cylinders are in two blocks of three each. Evidence of the influence of aero-engine design is seen in the overhead valves, which are actuated by short rockers, direct off a central overhead cam-shaft. The valves, both feed and exhaust, are slightly inclined from the vertical, making room for the cam-shaft to lie between them, so disposed as to allow them to be removed without dismantling the cam-shaft. The valve mechanism is enclosed by an aluminium cover, and the engine presents an extraordinarily clean and simple exterior. The car exhibited is a distinctly fine specimen of a "Vee"-fronted saloon limousine. An interesting feature of the design is provided by the line which forms the apex of the bonnet being carried right through the body-work, and also embodied in the design of the mud-guards. The car is painted pale-grey up to the waist-line, the head above being black. The bonnet is of polished aluminium, and the wheels are grey to match the body. The interior is upholstered in black morocco leather, with grey silk curtains and pillow cushions. The roof and doors strike a very rich note, being panelled in polished walnut inlaid with marquetry of a handsome scroll design. The car as a whole is stamped with that indefinable air which denotes caste, and is a production well up to the Lanchester standard for excellence.

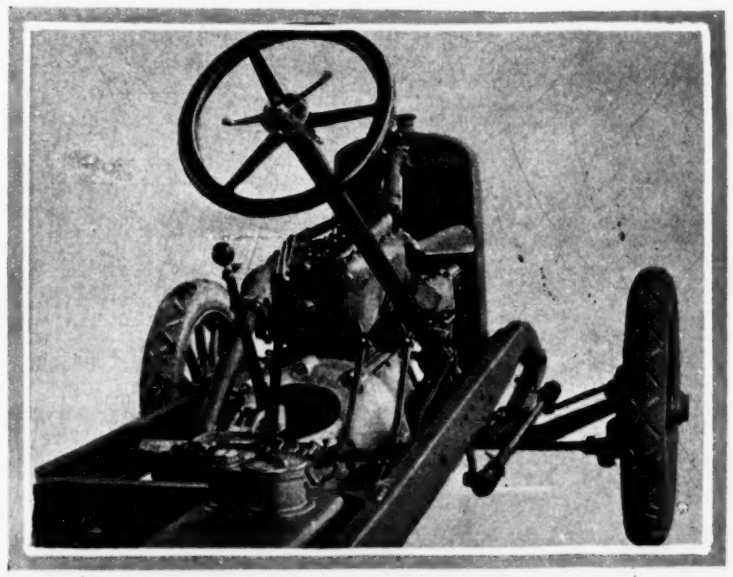


PRICED AT £700: THE NEW ROVER FOUR-SEATER.

An Arrol-Johnston Surprise. Messrs. Arrol-Johnston have a surprise for the visitor in the shape of a new 15·9-h.p. car. The "Victory" car we heard all about some time ago, but this other is something which the company had not disclosed at all until the other day. As a matter of fact, the "Victory" Arrol-Johnston is of the same rating, but it has many points in which it differs from the firm's previous practice. Here again the influence of the aero-motor is observable throughout the design of the engine, with its overhead valves and enclosed working parts. Another point taken from aero practice is that cooling of the motor is effected by means of a circulating pump, which passes the water through a honeycomb radiator. Of course, pump circulation of the water is as old as the motor-car itself; but previous to the war the thermo-syphon system of circulation had become almost universal, and it was a rarity to find a water-pump as part of the modern car's equipment. Now thermo-syphon cooling seems to be suffering a set-back in favour of the older and certainly more efficient system. Personally, I have always had a weakness for the pump, and it is therefore with some amount of satisfaction that I note the prevailing tendency to return to the pump.

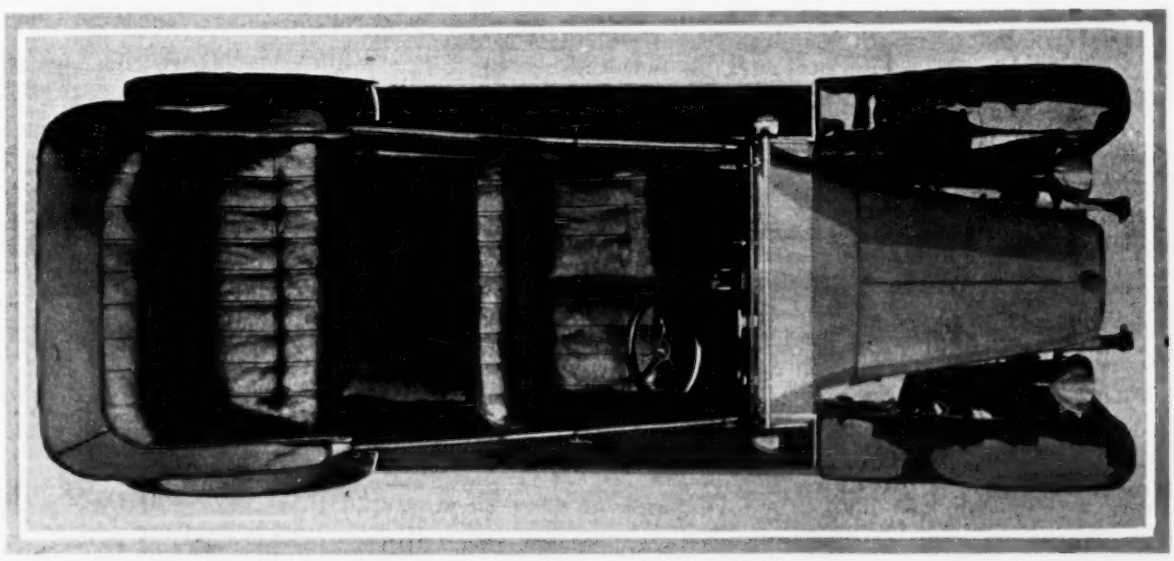
The gear-box gives four forward and one reverse speeds. Power transmission is through a clutch of the internal-cone type, of pressed steel, Ferodo lined, with double flexible joints, enclosed in a housing integral with the gear-box, between the latter and the clutch. From gear-box to back-axle the drive is taken through a propeller-shaft, enclosed in an aluminium-cover tube bolted to the rear axle, and thence through bevel gearing of conventional type. The Arrol-Johnston is another example of the hold that cantilever springing has taken of the car-designer. As usual, the front springs are of the semi-elliptic type; but the rear suspension is by means of cantilever springs of ample size to ensure comfort. Undoubtedly this new Dumfries production reads like a very fine car indeed. From the earliest days of motoring in Britain the Arrol-Johnston has stood high in the estimation of experts, and the "Victory" type should do a great deal to enhance that already high reputation.

There is yet another model, which constitutes the surprise of which I have spoken. This is the model which is simply known as the "Fifteen-point-nine." I have not seen this car yet, but it seems to be a very much improved edition of the pre-war car of the same rating. Although of the same nominal rating as the "Victory" model, this car has a smaller engine—80 by 120 mm. against 80 by 140 mm.; but the motor is much more conventional in its design. It is an L-headed engine, with all the valves disposed on the off-side. Cooling is by thermo-syphon, marking a difference between this model and the "Victory" car. There are also fundamental differences in the transmission lay-out. The clutch is of the three-plate metal-to-metal type, driving through a four-speed gear-box and unenclosed propeller-shaft with a single universal joint at the forward end. Another point of difference is that full elliptic springs are employed as the rear suspension. These are certainly two very interesting models, and I imagine will attract a large number of visitors by their undoubted originality of design and the sterling workmanship which has always been a characteristic of Arrol-Johnston productions.



THE AUSTIN "TWENTY": THE POWER AND TRANSMISSION UNIT.

Progressive Austins. In these days of high prices of everything and of cars in particular, the exhibit of the Austin Motor Company will attract more attention than most, since it demonstrates a sincere and successful attempt at meeting the demand for a car of distinction and merit at a cost rendered moderate by quantity production—150 cars per week is the output aspired to by the management at Northfield. To this the company is concentrating on a single model—the "twenty." This is to be sold at £395 in chassis form, or, with touring, coupé, or landaulette bodies, at £495, £595, and £625 respectively. All these models, as well as the chassis, are exceedingly well-looking productions, and, after seeing them, one ceases to wonder at the rush that was made for them when their details were first made known to the Austin agents, and through them to prospective Austin owners. They strike one as being eminently good productions, and one is left wondering how it is done at the price. Still, done it is, and that is all there is to be said on that count, save that, in case anyone should infer that it is only achieved at the cost of quality, it may be remarked that Austins have never yet built anything but a "quality" car. Their



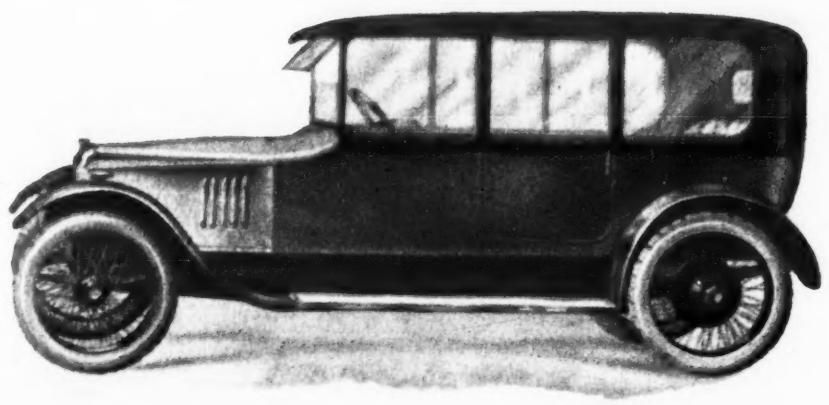
IN PLAN: THE AUSTIN "TWENTY" TOURING CAR.

Vauxhall
THE CAR SUPEREXCELLENT

OLYMPIA MOTOR SHOW
NOVEMBER 7-15 STAND 47

THE ENGLISH TRADITION of fine quality—of making a thing to be the best of its kind—is the keynote of the Vauxhall exhibit. The open cars on the 25 h.p. chassis and on the 100-miles-an-hour 30-98 h.p. chassis, the interior-drive cabriolet on the 25 h.p. chassis, and—something never seen before—the coupé on the 30-98 h.p. chassis, provide a feast for the man with an eye for line and a taste for distinctiveness.

The car with the finest war reputation



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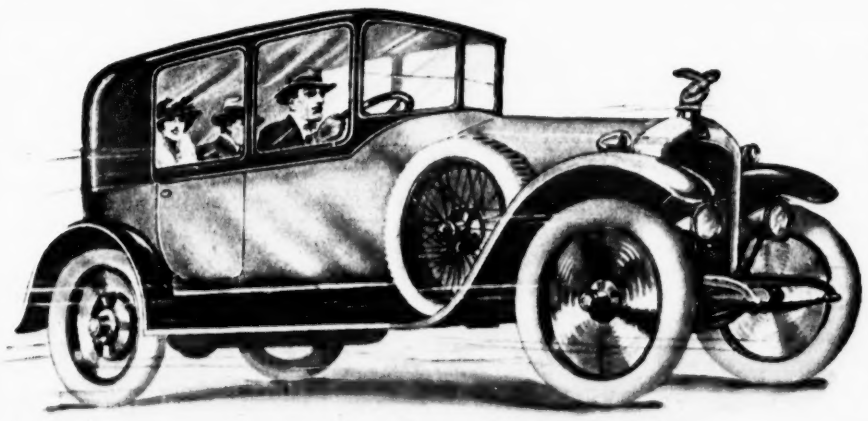


The
AEROPLANE
of the
ROAD

IMAGINE a 20-25 h.p. Touring Car combining *super*-luxurious appointments with all the essentials of aircraft construction—speed—lightness—rapid acceleration—and above all, *absolute reliability under all circumstances*, and you will realize just why the STRAKER-SQUIRE "SIX" is called the "Aeroplane of the Road."

As a matter of fact the new "S.S." models, no matter what body you may prefer—Saloon—Limousine—or Cabriolet, are a *development* of aircraft principles applied to road conditions, rather than a development of *pre-war motor car standards*.

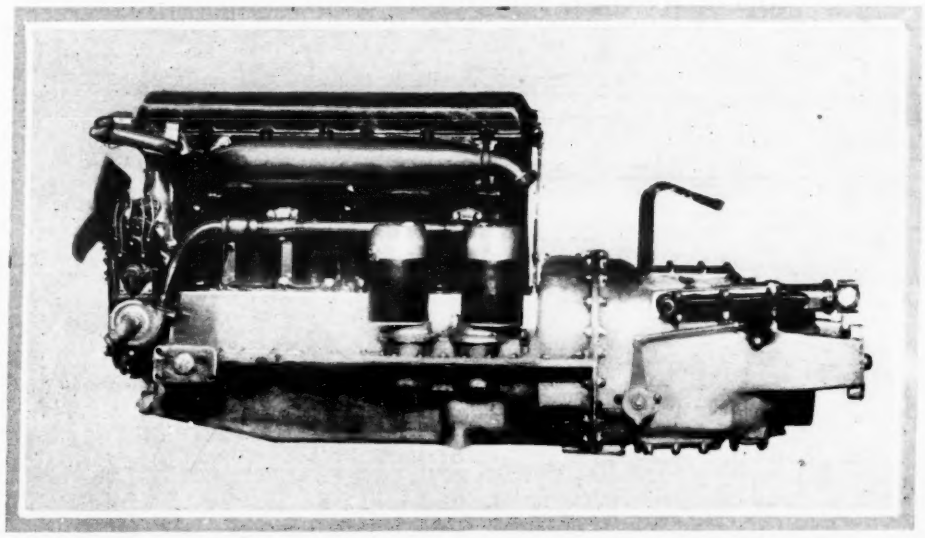
If you desire a Car which, as one enthusiast said, is "A bird on the wing," coupled with every conceit of the coach-builder's art, let us entertain you at our Stand, and afford you afterwards the practical test of a trial run.

OLYMPIA MOTOR SHOW
November 7-15.
STAND No. 76

STRAKER SQUIRE

reputation stands high in the automobile world, and it is not in the least likely that they are inclined to risk it for the sake of a policy. It will possibly be of interest to review briefly the main features of what I feel justified in describing as a remarkable car.

The engine is of 22·4-h.p. R.A.C. rating, and develops 45-brake-h.p. at 2000 r.p.m. It is of mono-bloc form, with detachable head of L shape, and has aluminium pistons. Lubrication is by a gear-wheel pump, forcing oil to all bearings through the hollow crank-shaft, which is supported by five bearings. The cam-shaft is driven by a broad silent chain, which also rotates a spindle driving the magneto and water-pump on the near side. This spindle carries a pulley which, through a Whittle belt, drives the dynamo and the fan. Cooling is effected by pump circulation, and ignition by Watford magneto. The carburetter is a Zenith, fed by an Autovac tank, and, as it is heated by the exhaust gases, is particularly suitable for use with benzol. A single-plate clutch with Ferodo friction surface is fitted. It is carried in one unit with the engine and gear-box, forming a three-point-suspended unit. Four forward ratios and a reverse are provided, and changes are secured by a central lever mounted on the top of the box. The hand-brake is also centrally mounted, and actuates directly Ferodo-lined shoes pressing upon a drum behind the gear-box. Final transmission to the live semi-floating rear axle is through helical bevel gear mounted on roller bearings and having ball thrusts. Expanding pedal-operated brakes act on the rear wheels. Detachable artillery-wheels of the usual Austin pattern are fitted, and Clincher tyres have been adopted as standard. Front wheels run on roller bearings with ball thrusts, and rear wheels on ball bearings. The road springs are semi-elliptic; and the rear ones, which are underslung, are 60-in. in length, and give very easy riding. The honeycomb radiator is protected by a frame, to which it is not connected, from risk of damage. Sixteen gallons of petrol can be carried, and the average consumption is about a gallon for twenty miles. Body design has also been carefully studied, and the "Austin Twenty" is distinctly graceful and pleasing in outline and finish; while its artistic lines have been preserved by provision in the body work of a closed container for the hood and one for the two spare wheels. This arrangement also protects and preserves these fittings. The driver's seat is adjustable for angle and position. The car has a metal-framed wind-screen, with both halves deflecting. Accessories supplied with the "Austin Twenty" include two spare wheels, five lamps, speedometer, tools, and horn; while C.A.V. electric lighting and starting equipment is standard. The chassis alone, and cars of the three different types, are exhibited. The "Austin Twenty" coupé has a roomy streamline body, and, as in the touring model, the driver's seat can be adjusted for angle and position. When the car is made open and the window frames are not in use, they are accommodated inside the doors.



THE LANCHESTER ENGINE: THE EXHAUST SIDE: WITH CLUTCH AND GEAR-BOX CASING.

Daimlers for the Owner-Driver. In the past the Daimler has been regarded rather as a car which was only for the wealthy motorist to whom a chauffeur was a matter of course. In these days of the "New Poor," and when people have to do most things for themselves—particularly if they desire them well and truly done—it is more than a little satisfactory to note that the Daimler Company has set out to provide a car of luxury which can in truth be said to be a car for the owner-driver — one which the owner can, with very little trouble, keep in order unaided. This is the new six-cylinder "Thirty." A six-cylinder car sounds a little ambitious as an owner-driver proposition; but when we come to examine the details of this new Daimler production it tends to become evident that it is not so very onerous a task that its owner has set himself when he undertakes to be his own chauffeur. To begin with, he will have no trouble in keeping his engine in tune. He has no valves and their gear to worry about, so that the principal objection to a multiplicity of cylinders is eliminated at once. Then the job of decarbonisation is an easy one compared with the conventional type of poppet-valve engine. Each single head can be removed separately for cleaning, and when it is replaced there is no valve-grinding to do. Moreover, my own experience of sleeve-valve engines is that they do not carbonise so rapidly as the more conventional motor; and even when the deposit is quite heavy their running is not so greatly affected. Not only in the engine is the "no trouble" design apparent. All through the chassis it is clear that the Daimler Company has been at considerable pains to simplify design and render the car as easy to keep in order as is humanly possible. And I must say they have succeeded admirably well. And not only does the car look well, but it runs as well as it looks. It is one of the few of the post-war cars I have had a chance of trying on the road, and its paces leave nothing to be desired by the most critical.

In addition to the "Light Thirty," there is another Daimler model of similar rating, known as the "Standard Thirty," which is a larger chassis, adapted to the fitting of a heavier type of body. Yet a third is the "Forty-five," a more powerful car for the choice of those who demand the combination of a luxurious closed body with ample power for fast touring work. Types of each of these models are shown on the Daimler stand, fitted with various styles of body-work. The whole makes a really notable exhibit which not only maintains the high reputation enjoyed by the famous Coventry firm, but materially enhances it.

ON A 30-H.P. DAIMLER CHASSIS: THE INTERIOR OF THE "SALTLEY" TYPE BODY.

Lodge Ignition Specialities. The Lodge sparking-plug, in its various forms for use in motor-car, motor-cycle, commercial car, aeroplane, and in fact all internal-combustion engines employing high-tension ignition, is represented on Stand No. 208. A complete range of Lodge plugs is shown, all being the exclusive products of the Lodge sparking-plug works at Rugby, the largest plug factory in the kingdom. The standard Lodge plug (model C_3) is manufactured on a mass-production basis, and for this reason it is marketable at the moderate price of 5s. This model is detachable for cleaning (two parts only), the only tool required being a spanner. The makers market a special double-ended box-spanner convenient for this operation. This Model C_3 Lodge plug is the type recommended for all normal engines of European make. There are variations of this, with either long barrel to suit valve-caps having a deep recess on the outside, or with longer thread (long-reach) to enable the sparking-points to extend the correct depth into the combustion space. Here again a number of different reaches is supplied, varying from ¾ in. to 2 in. A three-point spark-gap is adopted, this type having proved itself to be the best for easy starting, regular firing at low speeds, and maximum power at high speeds, in all normal engines. There is also the well-known Lodge weather-proof plug, Model MB, popular among motor-cyclists, particularly during the winter weather. This is now made with complete mica insulation. The top part is detachable and completely encloses the high-tension metal parts, thereby ensuring against leakage of the spark through dirt or moisture on the insulator, and providing a particularly neat and handy push-on terminal. For the American car or motor-cycle engine, a complete range of plugs is manufactured specially to suit the various threads in use, and the conditions under which these engines have to work.

It has been observed that the commonest trouble with American engines is oiling up, and this defect has been borne in mind in producing Lodge plugs for such engines. The Model CT_3 is suitable for engines having the A.L.A.M. thread; the AF_3 for those having the ⅛-in. taper gas thread; and the PF_3 for those with the metric thread.

Rotax Accessories. A firm that has come very much to the front in connection with electrical equipment is that of Rotax, whose exhibit will be found in the gallery. Their lighting sets and self-starters have been adopted as standard by a number of notable firms of car constructors, and it is an earnest of their quality that these continue their faith year after year. They stand the test of the private user too, for I have never heard complaints of the slightest unreliability of Rotax productions. This year's exhibit is of more than ordinary interest, owing to the fashion which has sprung up of fitting the self-starter even to the lightest of cars. Messrs. Rotax have laid themselves out to cope with the demand, and are showing examples of these devices suitable for all types of cars. One quite notable machine is the combined starter and dynamo, designed to take the place of the more complicated two-unit system in which starter and dynamo are separate machines. In addition to these interesting machines, they exhibit also a long series of lamps and electric accessories of all kinds, which are far too numerous even to mention in so cursory a review as this, but which should be seen by every visitor who contemplates fitting his car with electric light or starter. He need only see them to appreciate the amount of thought and skill which has been put into their design and manufacture.

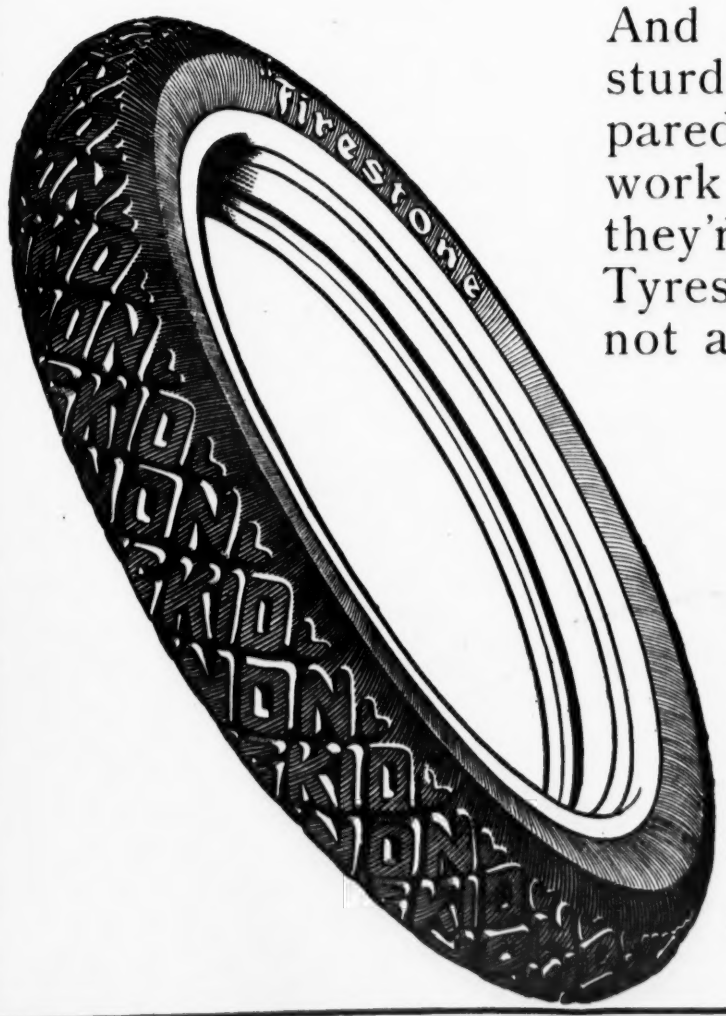
Firestone

TYRES

Firestone Tyres stand up under to-day's most exacting service because, from the first, their builders operated on the basis of how many miles a tyre should deliver and how much it should cost per mile.

Since so much of the efficiency and saving in motor-car service depends on its tyre equipment, now, more than ever, this policy of Most-Miles-per-Shilling building is appreciated. Naturally, Firestone Tyres are better qualified to meet the present strict standard of economy. Special fundamental features are exactly planned to give you long mileage at low cost.

And the unusual demands for better, sturdier performance find Firestone prepared. For tyres are like men—hard work and emergency action tell the stuff they're made of. This is why Firestone Tyres are the choice of the men who are not afraid of any work or weather.



MOST MILES PER SHILLING

We are exhibiting at the MOTOR SHOW, OLYMPIA, STAND No. 178.

FIRESTONE TYRE & RUBBER Co., Ltd.
216, TOTTENHAM COURT ROAD, LONDON, W.1
Telegrams: "Firtirubbo Ox, London." Telephone: Museum 1915-1916.
MANCHESTER: 2a, ATKINSON STREET, DEANSGATE.
Telegrams: "Firtirubbo, Manchester." Telephone: City 39.

149 B

Dunlops in the Tyre Section.

It is now more than thirty years since a little band of enthusiasts set out to convince the cycling world that there was something in the principle of the air-filled tyre. As contemporary history relates, they suffered like all pioneers for their belief, but an undeniable series of successes on road and track brought conviction in its train, and out of all arose the huge commercial fabric which is for ever associated with the name of Dunlop. Not only did the work of the pioneers make possible the growth of cycling, but it is not too much to say that had it not been for the invention by J. B. Dunlop of the pneumatic tyre there would be no motor car as we know it to-day. That being demonstrably so, there is always a sentimental interest attaching to the Dunlop exhibit at the Show, apart altogether from the fact that there is always something new and progressive to be seen at the habitat of this famous concern. As year succeeds year, they are able to show us improved tyres in which experience of manufacture and of use has led to those apparently negligible changes which really amount to a considerable total, and which in their sum have made tyre troubles few and far between. Then they are always able to show us all sorts of accessories and aids to tyre efficiency, which help to rob our roadside troubles of half their terrors. There are detachable wheels of all kinds and sizes, which render the work of tyre-changing on the road unnecessary, and which, unlike some detachable wheels of my acquaintance, remain where they are meant to stay—on the hub. It is not many weeks ago that I had a detachable wheel detach itself on the road, so I speak feelingly. There is nothing to do with tyres or wheels which cannot be seen at the stand of Dunlop, and the exhibit is one that most certainly ought not to be missed by the visitor, even though he may not happen at the moment to require replacements or new things in the lines affected by Dunlops.

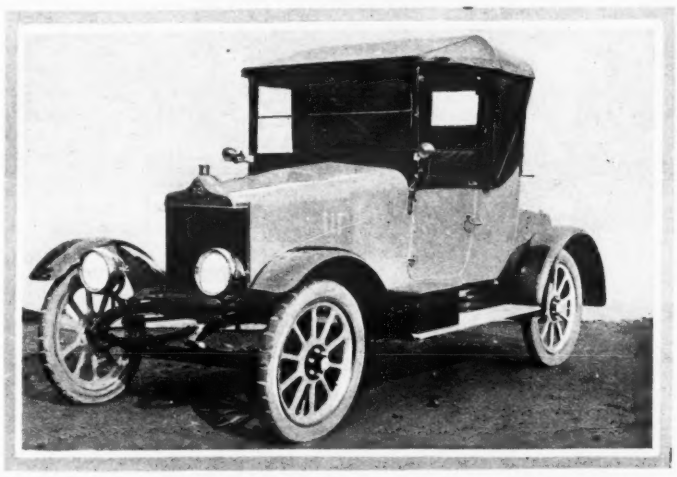
Vauxhall's New Model.

Among the few firms fortunate enough during the war period to have been kept mainly on their legitimate work of car-construction are Vauxhall's. Inevitably the result of that is that their car has improved progressively and has become almost insensibly, as it were, an enormously enhanced vehicle. It was the standard car for Staff work during the war, and it would be an extraordinary thing if the vast amount of experience thus gained had not resulted in a far better car than the Vauxhall we knew before the war. That, as we well know, was a car of great excellence of design and equal construction. Some of the pre-war Vauxhalls did really marvellous service in the war. I well recollect the old Vauxhall which served the late Gen. Botha as a Staff car during the campaign in South-West Africa. It ran like a thoroughbred all through, pushed to speed over the most appalling country that motor cars were ever called upon to work over. When cars of lesser quality hopelessly stalled or gave up and broke down, one would see the Vauxhall with the Commander-in-Chief on board pass like a whirlwind, going as though it positively revelled in its work. And if these old cars of 1914 were good, what is to be said of the Vauxhall of 1920? I think I have driven every type of Vauxhall since the first little 5-h.p. which made a non-stop in the Glasgow to London run of 1903, and thought the Prince Henry type was the last word. A recent visit to Luton and a road trial of the car convinced me, however, that Vauxhalls have succeeded in surpassing themselves. I need not now elaborate the technical details of the new model, since I have dealt with them in a previous issue of *The Illustrated London News*. All I need say is that the visitor to Olympia who does not make a point of stopping at the Vauxhall stand will have missed seeing one of the finest British cars in the Show.

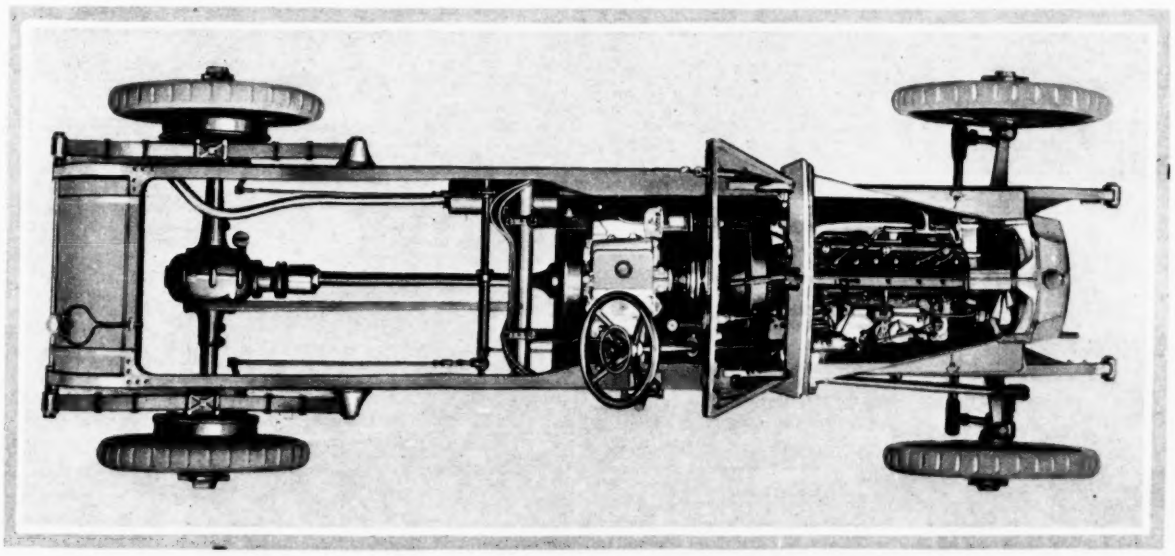
An Armstrong-Siddeley Triumph.

By concentrating upon one model and utilising their extensive experience of motor-car and aero-engine manufacture, the makers of the new Armstrong-Siddeley six-cylinder car—who represent a fusion of the interests of the motor department of the firm of Sir W. G. Armstrong, Whitworth, and Co., Ltd., and the Siddeley-Deasy Motor-Car Company, Ltd., of Coventry—are able to offer a really high-grade chassis, with a six-cylinder engine guaranteed to develop 60-b.h.p., a full equipment, and every desirable refinement, at the unusually low price of £720. Quantity production has very largely assisted to this end, and an output of 5000 cars per annum has been planned. The engine has its six cylinders (3½ by 5½-in. bore and stroke) cast in two blocks of three; large aluminium plates enclose the side water-jackets, and detachable aluminium top jackets carry the overhead valves and rocking levers. The latter are operated by tubular push-rods encased in aluminium tubes, and are operated through tappets from the silent chain-driven cam-shaft. The overhead valve-gear is also enclosed; so that all the operating mechanism is protected and screened from view, though immediately accessible when required.

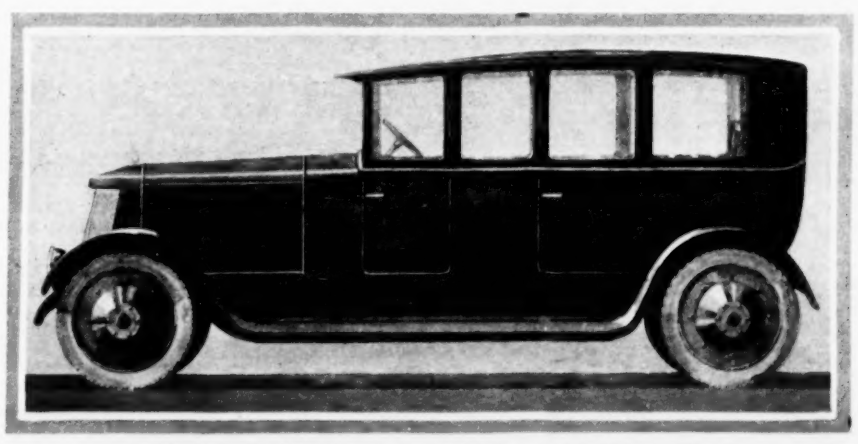
Pump water-circulation, magneto-ignition, and forced lubrication to the crank-shaft journal and big-end bearings have been adopted, the oil also being led under pressure to the cam-shaft bearings and overhead-valve gear.



AN INTERESTING MODEL: THE NEW 9·5-H.P. STANDARD CAR.



THE 25-H.P. VAUXHALL CHASSIS: A PLAN VIEW.



A POPULAR SALOON CAR: THE POST-WAR ARMSTRONG-SIDDELEY.

Tubular connecting-rods are used, with hollow gudgeon-pins secured from lateral movement, but floating in bushes in the small ends and in the bosses of the light cast-iron pistons. Provision is made for a mechanically driven tyre-pump, an electric-lighting dynamo, and an engine-starter the latter driving the front end of the crank-shaft through a chain and free-wheel clutch, the chain thus being in operation only during the process of starting.

The drive is taken by a multi-plate cluteh through a short universally jointed coupling-shaft to the three-speed gear-box, the rearmost joint being of the ball-bearing star type, entirely enclosed and lubricated directly by the oil in the gear-box. The latter is bolted to the flanged front end of the propeller-shaft casing and is an extremely stiff and compact unit, containing provision for a permanent speedometer-drive. The gears are operated by a centrally placed lever, alongside which is the hand-brake.

Helical bevel-gearing forms the final drive to the live axle, the shafts of which are secured to the wheel-hubs and differential casing by ends that are splined, tapered, and locked by nut and split-pin.

Both sets of brakes apply within 17½-in. diameter drums secured by studs and nuts to the rear wheel-hubs; exterior and easily accessible adjustments are provided for the brake-rods.

A special feature lies in the frame design, which, in plan, tapers outwardly from the front to a considerable width at the point where a cross-member occurs to carry, inside the frame, the centre of the adjustable cantilever springs. This design provides an unusually wide support for the body-work, increasing the stiffness of the super structure. A refinement that will appeal to the owner-driver is the use of self-lubricating bearings for many of the smaller details, such as shackle-pins and brake-shafts, thus eliminating the need for frequent attention to numerous oil-cups and greasers in inaccessible positions.

It will be realised that even in 1914 exceedingly good value would have been represented by such a high-grade and fully equipped chassis at the price named; at the present time, with labour and material costing more than double those of the pre-war period, the price must have been very considerably higher but for the favourable position and connections of the manufacturers for securing supplies of high-grade metals, the improved methods of manufacture, and the large output in view.

Every Accessory at Smith's.

The Smith equipment comprises one of the most complete and most up-to-date range of motor accessories ever offered. Their exhibits at the Olympia Show (Stand No. 345 in the Gallery) include examples of the following Smith products: speedometers, revolution indicators, air speed indicators, motor clocks, pressure gauges, Petrol-tank gauges, carburetters, starting and lighting systems, electrical, mechanical and bulb horns, mascots, canteens, and interior fittings, tyre pumps, double acting jacks, and also M.L. magnetos, K.L.G. sparking-plugs, "Euk" easy starters, etc., for which Messrs. S. Smith and Sons (M.A.), Ltd., are the sole selling agents. Representatives of the various departments at their head office in Great Portland Street, and the managers and representatives of their depôts in Birmingham, Manchester, and Glasgow, will be in attendance at the stand throughout the Show.

It should also be noted that in addition to Messrs. Smith's Stand No. 345, the M.L. Magneto Syndicate, Ltd., for whom Messrs. S. Smith and Sons (M.A.) Ltd., are the sole selling agents, have a separate stand, No. 346, in the gallery, where all types of M.L. magnetos are exhibited and demonstrated. The experts of the M.L. Magneto Syndicate, Ltd., will be in attendance at this stand during the run of the Show.

Arrol-Johnston Car Models

at Olympia will include a new 15·9 h.p. type, with a most attractive modern Specification and a most attractive price. Trial Runs on application at the Stand.

NOT the old 15.9 h.p. Arrol-Johnston, as a glance at the Specification will show. A NEW model, beautifully finished and built largely in Aircraft Material.

THE famous "Victory" Arrol-Johnston and the new car will be found on Stand 48 (turn half-right on entering at Addison Road, and walk three stands up), and will offer an excellent basis for comparison.

ARROL-JOHNSTON, Ltd.,
DUMFRIES.

LONDON AGENTS: Messrs. Leverett, Thorp & Kearton, Ltd., 122, New Bond St., W. 1.

QUITE frequently a word from without rouses us to the merit that sits by our own fireside.

By such simple, human process the Cadillac is being re-discovered by way of France. The war zone was a huge demonstration ground, and it thrust the Cadillac into the greatest prominence.

Army men saw the car doing almost impossible things, day after day, with the same constancy that characterises it on British roads.

And they were witness to the frank and ungrudging admiration of the Allied Nations which pride themselves on motor refinement.

They realise fully, for the first time, how highly the whole world esteems the Cadillac.

Stand 96, Olympia.

F. S. BENNETT, LTD.
(Sole Concessionnaires),
Cadillac House, 24-27, Orchard St., Oxford St., London, W. 1
Telephone: Mayfair 5141. Telegrams: "Efisben, Baker, London."

AT OLYMPIA

the Crossley 25/30-h.p. R.F.C. Model is exhibited on Stand 92.

THE fine record of the Crossley car, its splendid achievements in connection with the Royal Air Force, and the high standard of its present-day performance are convincing evidences of its efficiency. For those who desire a "Quality" car there is no better choice than a

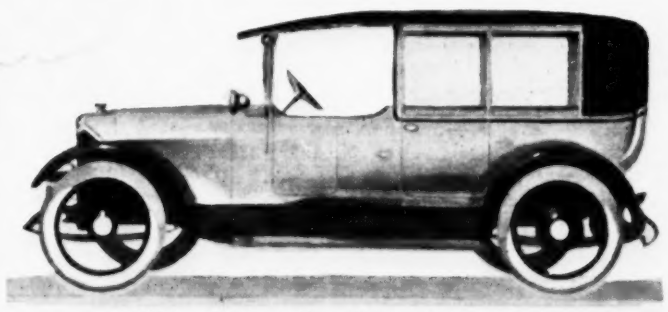
Crossley

25/30-h.p. R.F.C. Model.

Chassis Price (including electric starter and lighting), **£950.**

CROSSLEY MOTORS, LTD., Builders of Quality Cars, Manchester. London Office and Service Depot: 50, Page Street, Westminster, S.W.

STAND 92.



25/30-h.p. Crossley "Chester" Limousine Landaulette.

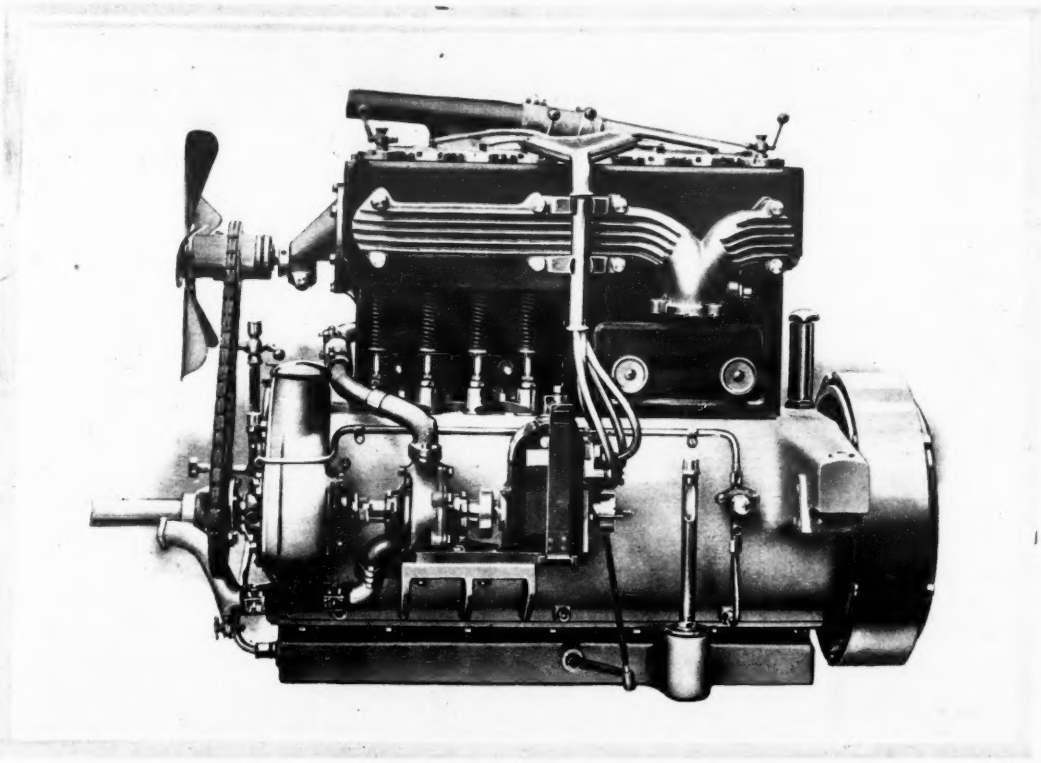
A Completely New Crossley.

One of the few firms fortunate enough to have been retained on their work during the war-period was the Crossley concern, of gas-engine fame. The Crossley car was adopted as the standard for the use of the R.F.C., and the principal energies of the motor side of the business were concentrated on the output of these cars. Therefore, the post-war model may be said to be the result of cumulative experience in the war zones, and it is self-evident that the new Crossley is rather the embodiment of that experience than of revolution in design. Indeed, there is nothing at all which can be remarked upon as a radical departure from previous practice, but the total of detail changes and improvements is really large when it is reckoned up; so that it is possible to say that the new Crossley is a vast improvement over the pre-war car, good as we know that to have been. As to details, it may be noted that the four-cylinder engine has its cylinders cast in pairs, with ample water-jacket space through which water is circulated by means of a pump driven by the same spindle which operates the magneto. The bore and stroke of the engine are 101·6 mm. (4 in.) by 140 mm. (5½ in.), giving an R.A.C. rating of 25·6 h.p. The crank-shaft is of the five bearing type, and is accurately machined all over. Plain bearings are used and are lubricated on the pressure system by a pump at the forward end of the cam-shaft, outside the timing-gear cover. The oil is delivered to the bearings by direct leads. The valves are of large diameter and small lift, and are situated side by side on the near-side of the engine. The cam-shaft operating them has five bearings, and is offset to the bottom of the tappets, which results in greater silence than is possible with direct lifting action, and also enables steeper cams to be used than would otherwise be available. The tappets are roller-ended, so that the lift is taken from the roller-bearing. The cam-shaft is totally enclosed in the crank-case, and is driven by a silent chain, which also drives the shaft providing the drive for the water-pump and magneto.

The adjustment for the chain is provided for by the movement of the water-pump and magneto unit on the platform. Ignition is by high-tension magneto, driven direct by an extension of the water-pump shaft. The magneto is held in position by a single metal strap and is easily removed and quite accessible. The carburetter is the well-known Smith four-jet type, with an extra jet added to facilitate starting. It is water-jacketed under pressure from the water-pump, and can be entirely dismantled without interfering with the water connections in any way. The cooling of the engine is by pump circulated water through a large radiator of pleasing design, carried on the frame of the chassis by ball swivel brackets which effectively prevent the radiator being injured by any frame-distortion.

An electric starting and lighting set is fitted as standard. A neat switch-board is placed on the dash, together with a small lamp in series with the rear light, so that the driver can see immediately if his tail light is out of order. An electric horn is supplied. A speedometer is fitted flush in the dash, and is driven from behind the gear-box. The starter pinion engages with teeth not cut on the periphery of the flywheel, but formed in a ring, mounted on the flywheel, which may be removed should it suffer damage at any time.

The clutch is of the internal self-contained type lined with Ferodo. The gear-box is of the four-speed type, and the shafts, which are extremely substantial, run on ball bearings. The direct drive is obtained by means of internal and external gears of ample width, which prevents damage or undue wear. The gear-box is very substantially carried from two of the tubular cross members of the frame. The change-speed control is located inside one of the tubular cross members of the frame, thus overcoming any liability to damage through frame-distortion.



THE CROSSLEY MOTOR: THE EXHAUST SIDE.

The drive from the gear-box is taken to the back axle by means of an ordinary cardan shaft enclosed in the torque tube, at the forward end of which is a universal joint. The rear axle is of the full floating bevel-driven type and, the whole of the transmission is sturdy, and, though adequately enclosed, the various parts are readily accessible. There are no radius rods for the axle, but triangular strengthening stays are led from close up to the rear wheel hubs to immediately behind the propeller-shaft brake.

The foot-brake operates on the drum behind the gear-box, and is of the internal expanding principle. The hand-brakes operate on the rear wheel drums in the ordinary way, and are also of the internal expanding type.

The steering is of the ordinary worm and wheel type, both of which are made of case-hardened nickel steel. Special provision is made for taking up any wear that may develop in course of time. The method adopted is distinctly interesting, for on the Crossley chassis the steering arm shaft is mounted in an eccentric bearing, so that when the new part of the worm wheel is brought into mesh with the worm, the wheel may also be raised so that the wear in the worm is compensated. Particular attention has been paid to the suspension of the chassis. The front springs are semi-elliptic and the rear springs three-quarter elliptic; the latter are under-slung from the axle casing. The shackles take their stress in tension, instead of the more usual method of compression, and the shackle bolts are lubricated. Rudge-Whitworth detachable wire wheels and Dunlop tyres are fitted.

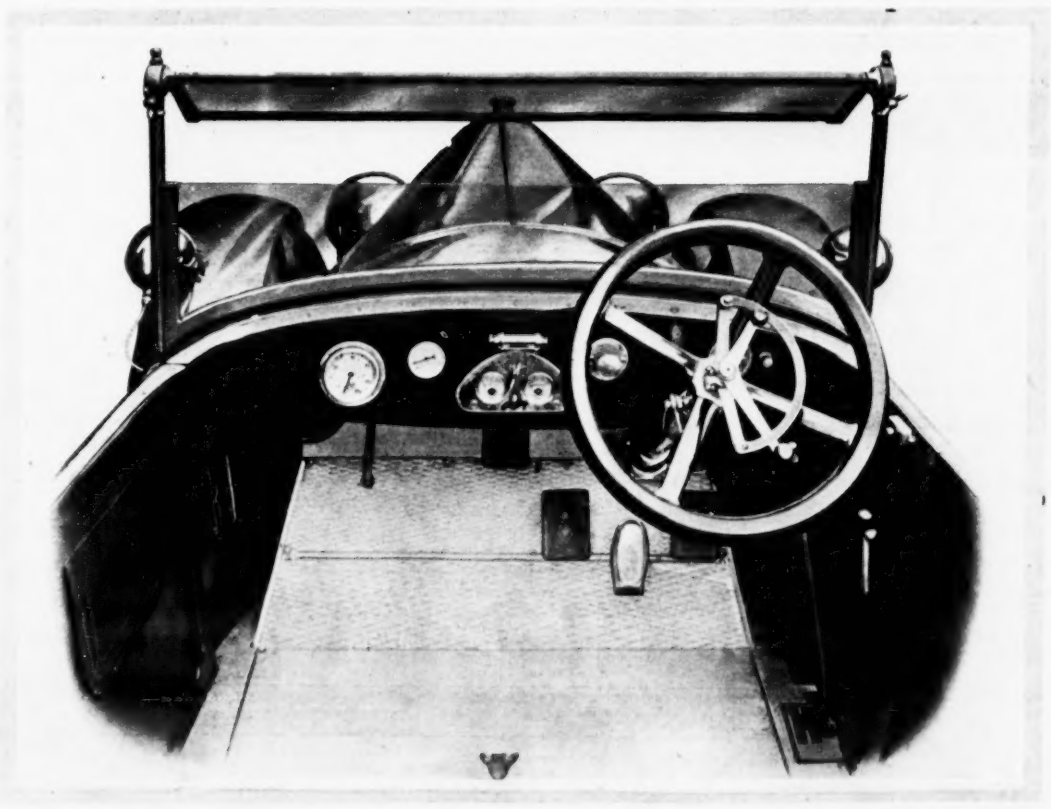
Each Crossley chassis undergoes a most strenuous test of upwards of 100 miles on the road before being passed. The chassis is loaded with 15 cwt. of sand, and is then sent out in the charge of a highly skilled tester: the distance covered includes some of the heaviest portion of the Peak district of Derbyshire. After this run the engine is taken down and thoroughly examined, and any small defects which have been discovered by the tester are remedied. After re-assembly, another long test follows, after which the body is fitted and the complete car is given a final road-test.

The Crossley chassis is sturdily built, and in view of the lamentable state of the roads now, this is perhaps just as well.

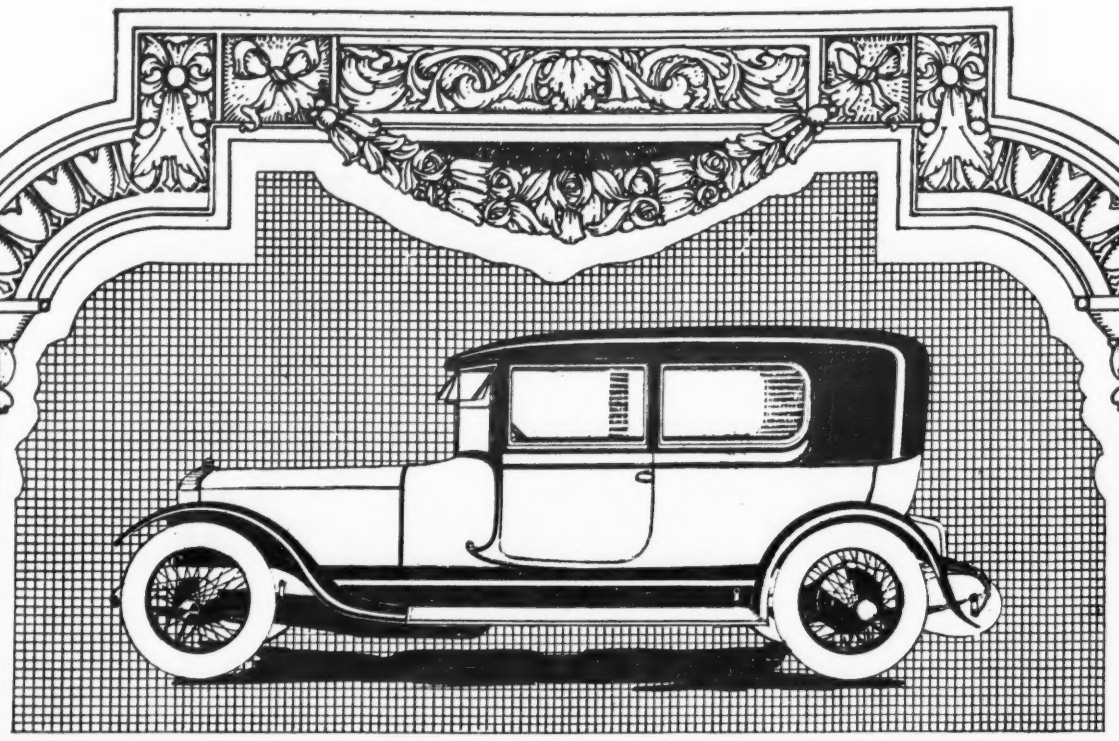
A New Napier.

One of the most outstanding examples of the effect of aero-motor practice on the car is to be seen in the new 40-50-h.p. Napier. It is claimed for this new car that it is not a pre-war model, merely improved in detail, but an entirely new production. This claim is certainly justified, since the car is a complete departure from all we have hitherto been accustomed to regard as accepted Napier practice. At once the visitor is struck by the entirely original design of the motor, which is exceptionally clean in its lines. Aluminium figures very largely in its construction, the method of using this metal for the cylinder casting, with steel liners, having been adopted. All working parts are enclosed, and the valves, which are of the overhead type, are, with their simple actuating mechanism, mounted on a single detachable head and enclosed within an aluminium oil-tight cover. All the valves, both inlet and exhaust, are very accessible and are removable without its being necessary to lift the cylinders, as is the case with some overhead valve engines. The electric starter and lighting dynamo are built in—not added as an apparent after-thought; and, incidentally, two ignitions are provided, the one by high-tension magneto, and the other run through a coil and distributor from the lighting batteries. The whole design of the motor is essentially simple and workmanlike, and impresses one with a sense of efficiency. It may be remarked that this engine is a full 200 lb. lighter than the pre-war type of similar rating, while it actually, on test, developed 50 per cent. more power—so much has been learnt by Napiers as a consequence of their work on the "Lion" aero-engine.

When we come to a consideration of the chassis details there is not the same apparent departure from previous practice to be noted. Generally, it would be said to be very little changed from what we saw of the Napier before the war, save that it has been thought fit to follow the American lead and place the change-speed and brake levers



LOOKING FORWARD FROM THE DRIVING-SEAT OF THE CROSSLEY: THE INSTRUMENT-BOARD.



Cole Carriages at Olympia

THE 4-SEATED C.C.C. ON 30-H.P. DAIMLER
(as illustrated),

THE 4-SEATED C.C.C. ON 25-H.P. VAUXHALL
and

COLE IMPERIAL LANDAULETTE-LIMOUSINE
ON 25-H.P. TALBOT

THE Cole Coupé Cabriolet—popularly designated the C.C.C.—is the master four-seated all-purpose carriage. It was the original idea of Wm. Cole & Sons, Ltd.—in conception, in execution, and in name. The C.C.C. created the fashion in the all-open or all-closed car at will; it leads the fashion; it leaves imitations ten years behind in beauty of design, graceful appearance and exquisite finish. It is incomparable in execution of workmanship.

THE series of Cole Imperial Coachwork represent the highest standard of the coachbuilders' art. Every design gives the requisite suggestion of modishness without exceeding the bounds of dignity; luxurious while retaining quiet distinction. An exclusive atmosphere surrounds every production, and bears the impress of ripe experience and master craftsmanship.

STAND No. 148

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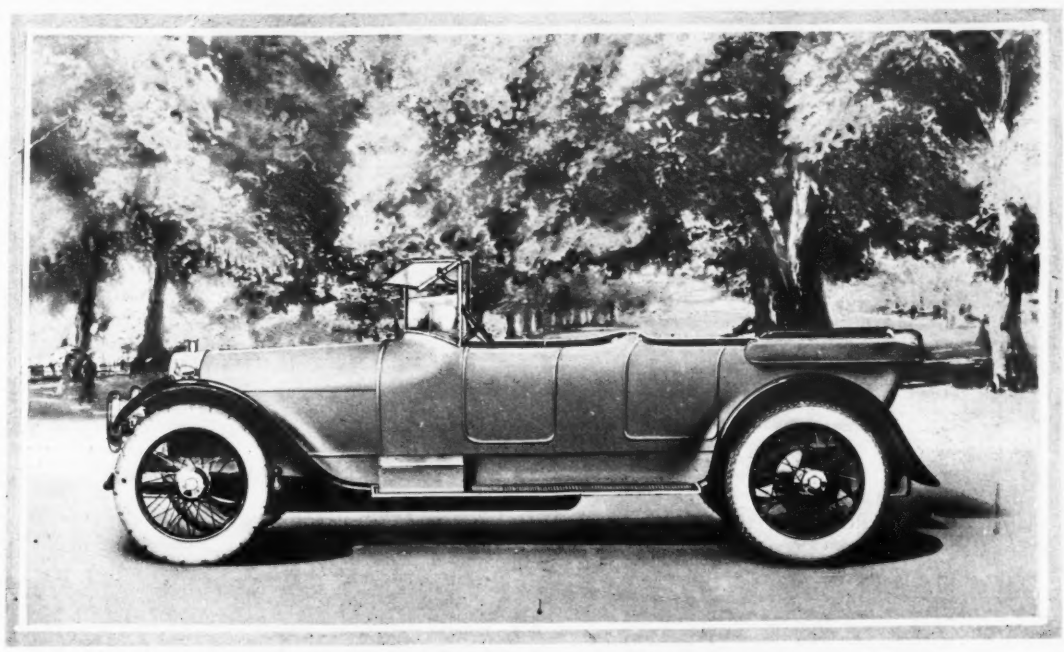
centrally instead of on the right-hand side of the car. But here is a case which points the moral of what I have said in my introductory remarks. Although there may be little apparent change, there has, in fact, been so much that the weight of the chassis has been reduced by several hundredweights—how many I do not know, but I am assured that it is as I have said. Obviously, this must tend to a great all-round improvement in efficiency of running, and to decrease the cost of upkeep very materially. It means increased life of tyres, less petrol-consumption, greater hill-climbing capabilities, and vastly less wear-and-tear to all working parts. There is no need to elaborate the description of this undoubtedly fine chassis, since it is one that I doubt not every visitor to the Show will make a point of seeing—and to see will be to appreciate. It is one of the few post-war cars I have had an opportunity of seeing and trying, and I must say it is one that impresses me very much, not only as a magnificent specimen of design, but as a car whose road performance, even when it is remembered that it figures as a high-powered vehicle, can only be described as phenomenal. The entire Napier exhibit consists of a chassis and three complete cars, the latter being (1) a limousine-landaulette, (2) a "sporting phaeton," and (3) a coupé-cabriolet—all the bodies being by the Cunard Company. The chassis price is given at £1750.



A FINE TOURING NAPIER: THE 40-50-H.P. POST-WAR MODEL.

A New Sizaire-Berwick.

The Sizaire-Berwick had been just long enough on the road at the outbreak of war to have made it a popular car among that widening class of discriminating motorists which does not mind paying a good price for a good car. It was all of the latter, and in addition was a car of much distinction and individuality. As a matter of fact, it was one of the few whose manufacturers allowed a great deal of latitude in detail in order to meet the tastes of its owners; and it was possible for the possessor of a Sizaire-Berwick to say that there was not another on the road which was exactly like his own. I understand that the firm intends to continue with this policy of individuality, and in their case it seems to be sound. The car is certainly not one that can be produced on mass-production lines—no car of the highest class can be so produced—and the policy of exercising meticulous care in construction and fitting of each individual car is undoubtedly the one promising the quickest road to success in the case of the really high-grade vehicle.

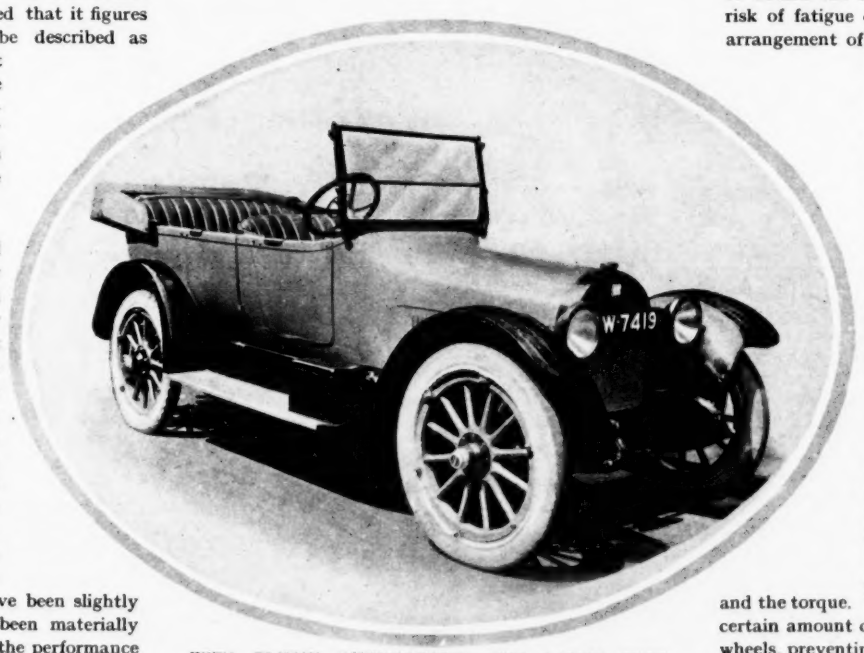
The new model follows that of 1914 in general outline; but it has, I am informed, been brought up to date throughout, and parts have been re-designed where improvements have been deemed necessary as a consequence of the experience of the war period. The chassis frame is of deep section, and a special alloy steel has been adopted in order to obtain the maximum strength of the section without risk of fatigue or crystallisation. Owing to the compact arrangement of the engine and the scuttle-dash, the very large body space of 10 ft. is available on the chassis. The springing is semi-elliptic on both front and back axle, and all the springs are exceptionally long. This arrangement and the careful distribution of weight throughout the chassis, combined with the low centre of gravity, ensures that there is practically no "roll" even on the worst roads. The rear axle is of the semi-floating type, and the wheel hubs are attached direct to the driving shafts, but the actual weight of the chassis is taken by large, self-aligning ball-bearings. The rear axle trumpets are formed from mild steel forgings, machined internally and externally. These are bolted to a strongly designed central casing of aluminium alloy containing the driving gear and differential. Following the standard Sizaire-Berwick practice, no torque-tube is fitted to the rear axle, as the springs are designed to deal with both the drive and the torque. Under this arrangement the springs allow a certain amount of flexibility between the drive and the road wheels, preventing snatching and wheel slipping in sudden acceleration, and ensuring a great reduction in tyre wear.

The universal joints are all fitted with ball-bearings. The plunging action of the cardan shaft is taken up at the forward end. The use of ball-bearings in this joint is probably unique, but the advantage is manifest, as it ensures that the end thrust on the neighbouring mechanism due to the plunging action of the cardan shaft is reduced to a minimum. Both front and rear cardan joints are enclosed in dust-proof and oil-tight covers.

The four-speed gear-box is carried on a special sub-frame, the three-point suspension principle being employed. The bearings throughout the gear-box are of the ball-and-roller types, and suitable provision is made for taking up end-thrust. The gear-lever and hand-brake lever occupy the usual position on the right-hand side of the driver. These levers are mounted on and carried by an extension of the gear-box, and are quite independent of the chassis frame. The hand-brake operates directly on the transmission at the rear of the gear-box, while a simple method of brake adjustment is incorporated in the gear-box itself.

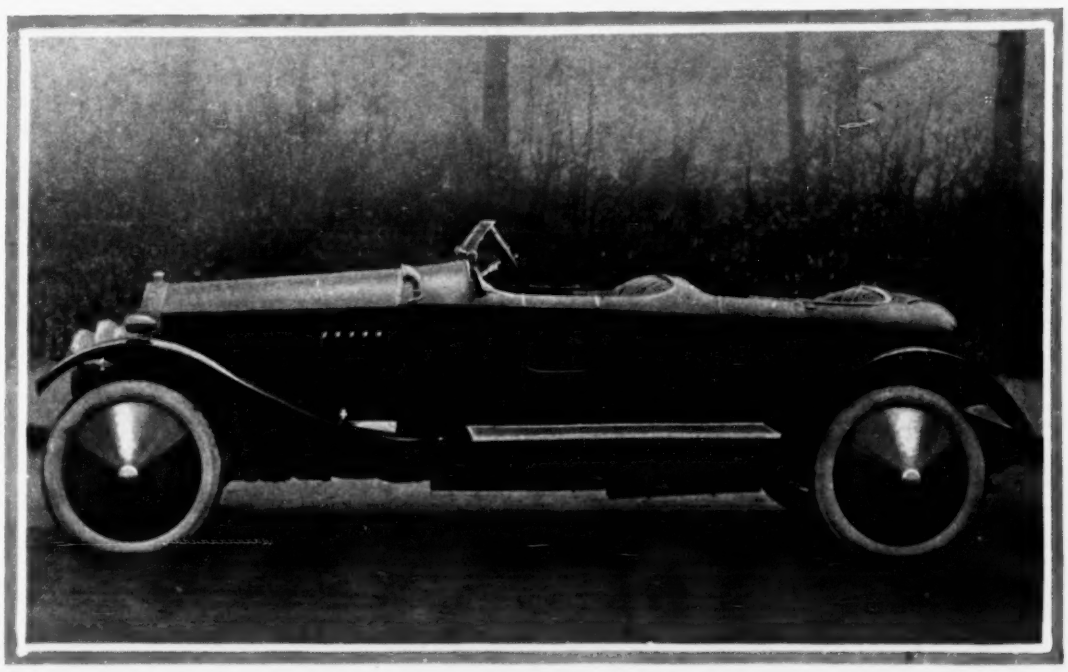
Buicks and Oldsmobiles.

The Buick is so well and so favourably known to British motorists that it is almost unnecessary to say that the new models shown at Olympia are worthy successors of those we have known before. The 1920 six-cylinder car is one that I like very much. It follows closely the lines with which Buick practice has made us familiar. Of course, the overhead valve system, which Buicks were one of the first to adopt, is retained, with the addition that the lubrication arrangements for the valves have been greatly improved. The dimensions of the motor have been slightly increased, while the chassis weight has been materially reduced; so that there is no reason why the performance of this new model should not easily eclipse that of its forerunners.



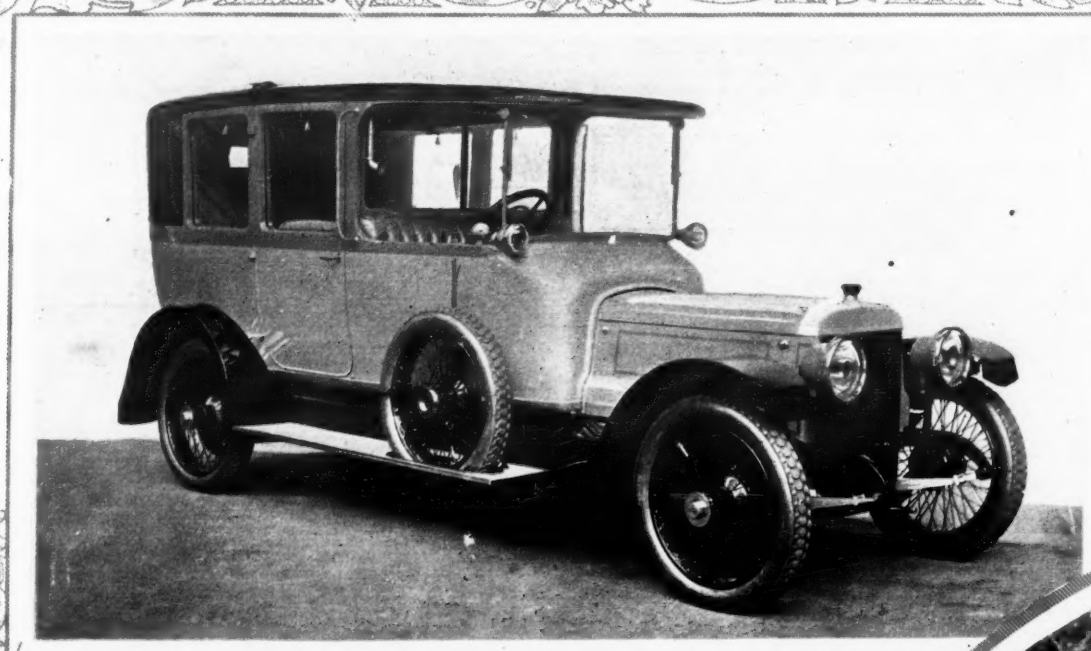
WITH BRITISH TOURING-BODY: THE LATEST TYPE OF SIX-CYLINDER BUICK.

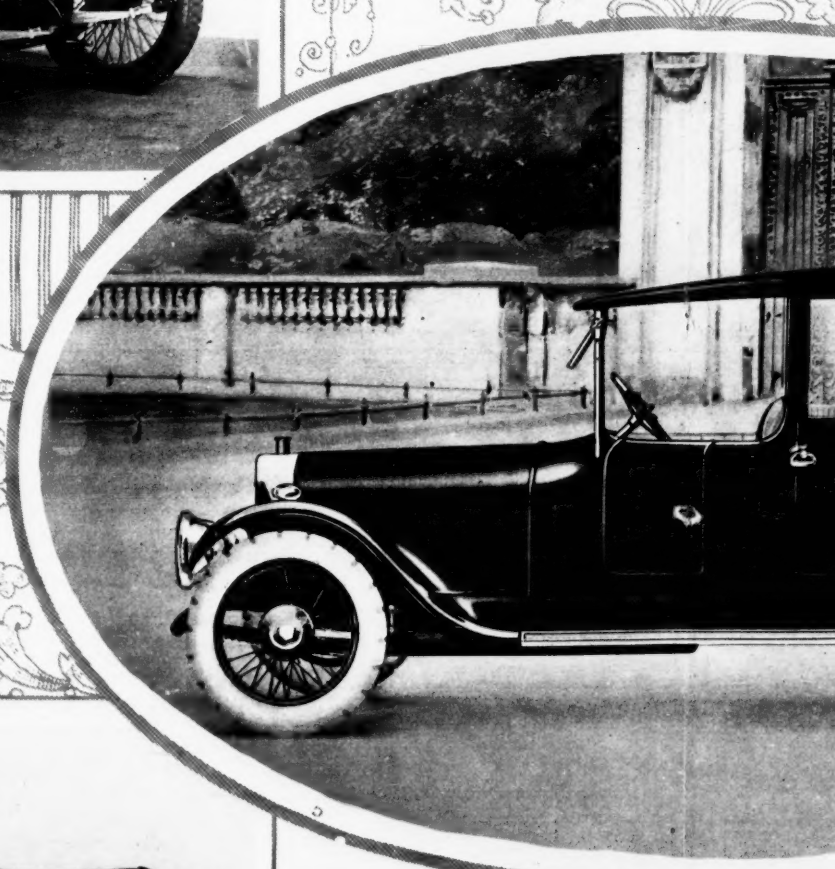
A car that is not so well known to the British public is the Oldsmobile, which is exhibited by Messrs. General Motors, Ltd. Many of the older school of motorists will remember the little tiller-steered 5-h.p. Oldsmobile, which made its début in England in 1903, and came rapidly into favour as being quite a good little car in its time. Any greater contrast than that between this original "Olds" and the handsome, eight-cylinder model of to-day cannot be imagined—it would not have been a bad idea to have staged the two side-by-side, if one of the originals still exists. From radiator to rear axle the new car bears the impress of careful thought in design, and the motorist who succeeds in getting early delivery of one of these exceedingly well-looking cars is to be envied. Even though an "eight" sounds a bit ambitious in these days, the price of the Oldsmobile, complete as a fully-equipped touring car, strikes one as being distinctly on the moderate side at £850. At this price it should command a ready sale.

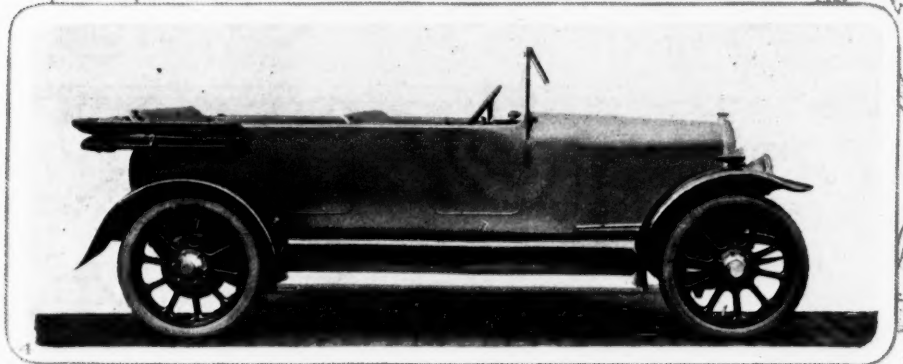


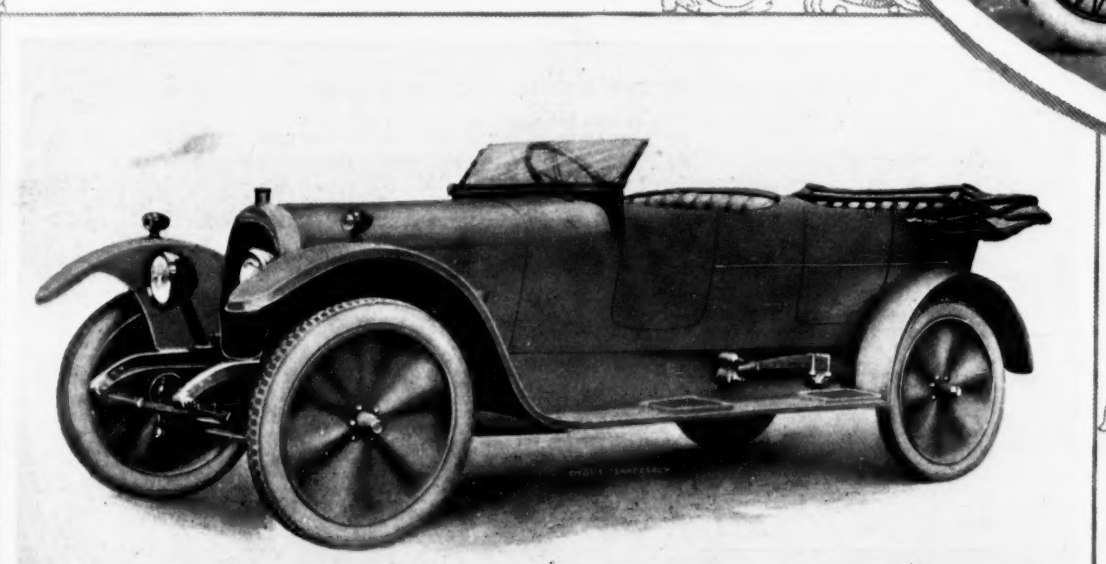
A DISTINCTIVE MODEL: THE SIZAIRE-BERWICK STANDARD TOURING-CAR.

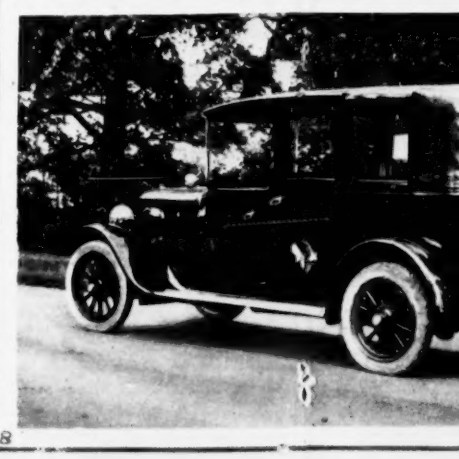
THE FIRST MOTOR SHOW AT OLYMPIA FOR SIX YEA







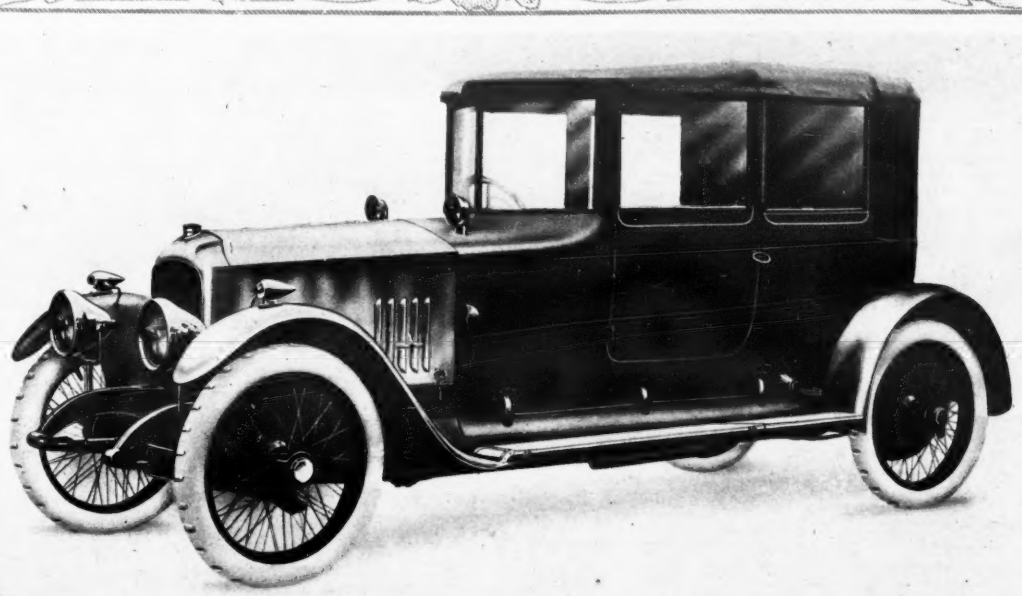


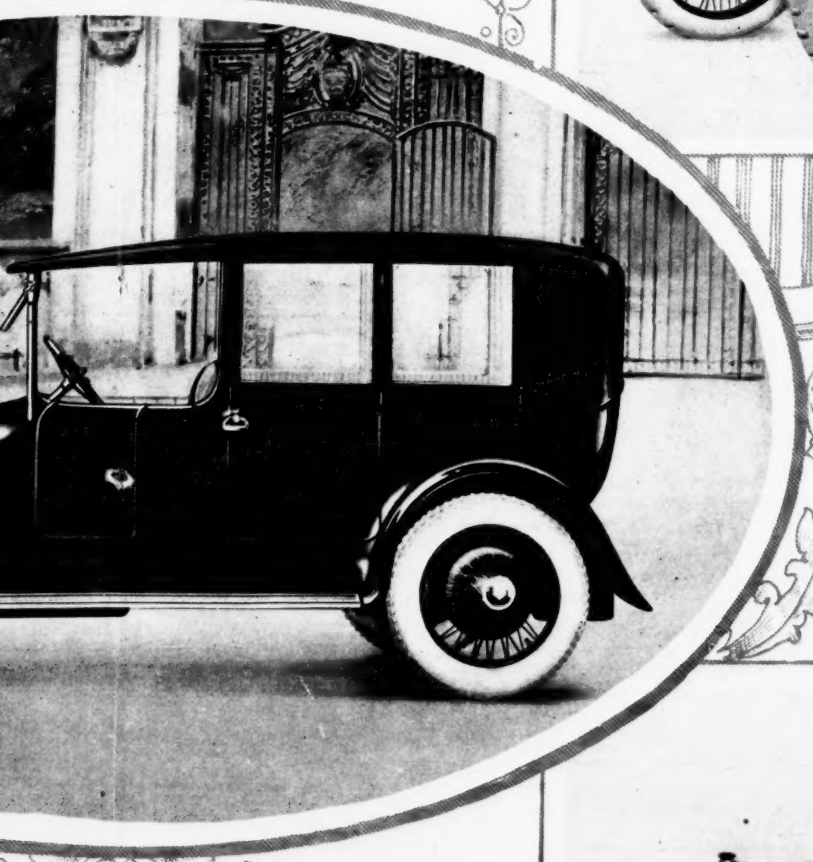


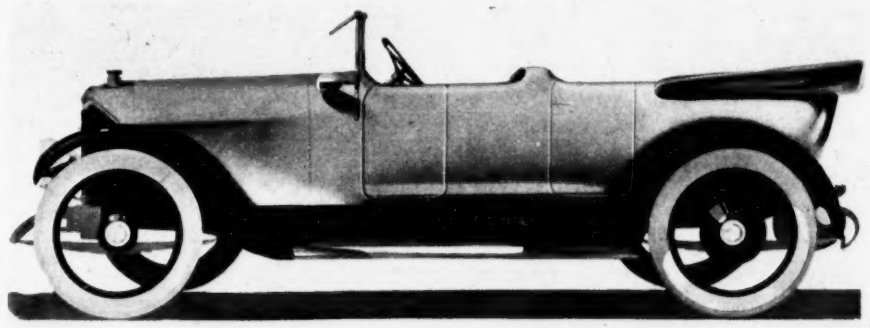
1. THE CAR OF KINGS: ONE OF THE NEW TYPE DAIMLERS.
2. A NEW AMERICAN IMPORTATION: THE EIGHT-CYLINDER OLDSMOBILE.
3. VAUXHALL'S LATEST: A HANDSOME CAR OF THE "ARUNDEL" TYPE.
4. ARROL-JOHNSTON'S SURPRISE MODELS: THE NEW "FIFTEEN-POINT-NINE."
5. THE NOISELESS NAPIER: A 40-50-H.P. CAR OF ENTIRELY NEW DESIGN.
6. FROM A F CAR.
7. PRODUCED

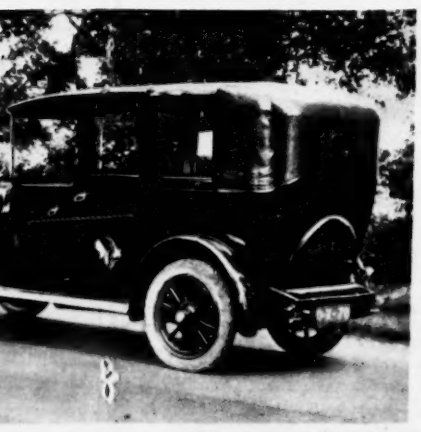
Not for six years has there been a Motor Show at Olympia. Therefore the present Exhibition, which is open between November 7 and 15, will be of surpassing interest to all who follow experience applied to the motor-car.

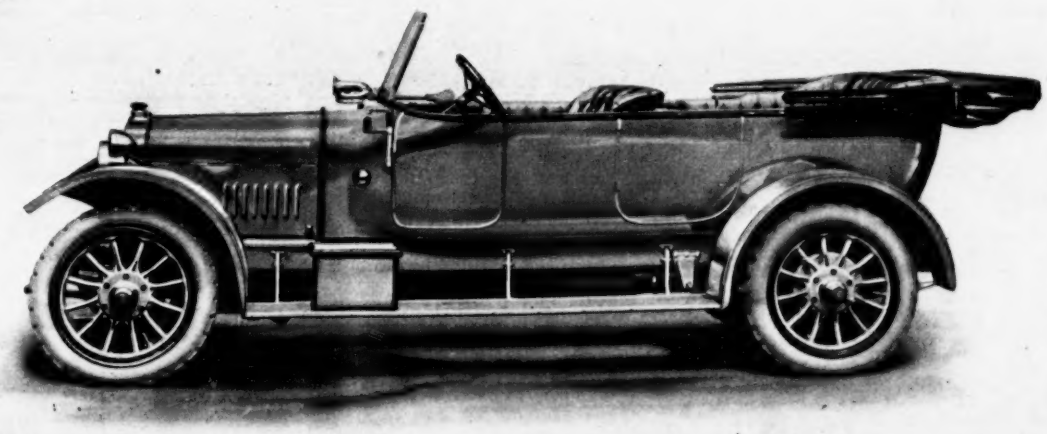
R SIX YEARS: NOTABLE EXHIBITS BY FAMOUS MAKERS.









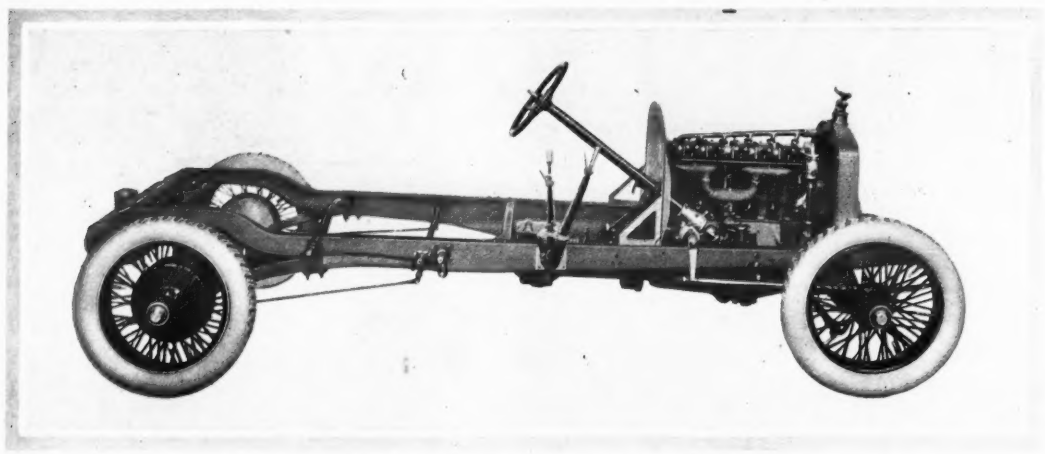


6. FROM A FAMOUS ENGINEERING WORKS: A 25-30-H.P. CROSSLEY TOURING CAR.
7. PRODUCED ON AMERICAN LINES: THE 13·9-H.P. ANGUS-SANDERSON.
8. A SHOWY AUSTIN AT MODERATE PRICE: ONE OF THE NEW "TWENTIES."
9. THE SPEEDY SUNBEAM: A FINE 16-H.P. FOUR-CYLINDER TOURING CAR.

DINT-
SIGN.

interest to all who follow the great automobile movement. To add interest to an always interesting Exhibition, under the roof of Olympia will be found the results of five years of war ce applied to the motor-car.

The foot-brake acts on the rear wheels. The brake-shoes are of aluminium and lined with "Ferodo." The special Sizaire-Berwick automatic brake compensating and adjusting gear has been retained in the new chassis, as years of experience have fully demonstrated its efficiency. The foot-brake adjustment is easily accessible, and is situated on the near side of the chassis immediately above the running-board.



THE SIX-CYLINDER STRAKER-SQUIRE CHASSIS: SIDE ELEVATION.

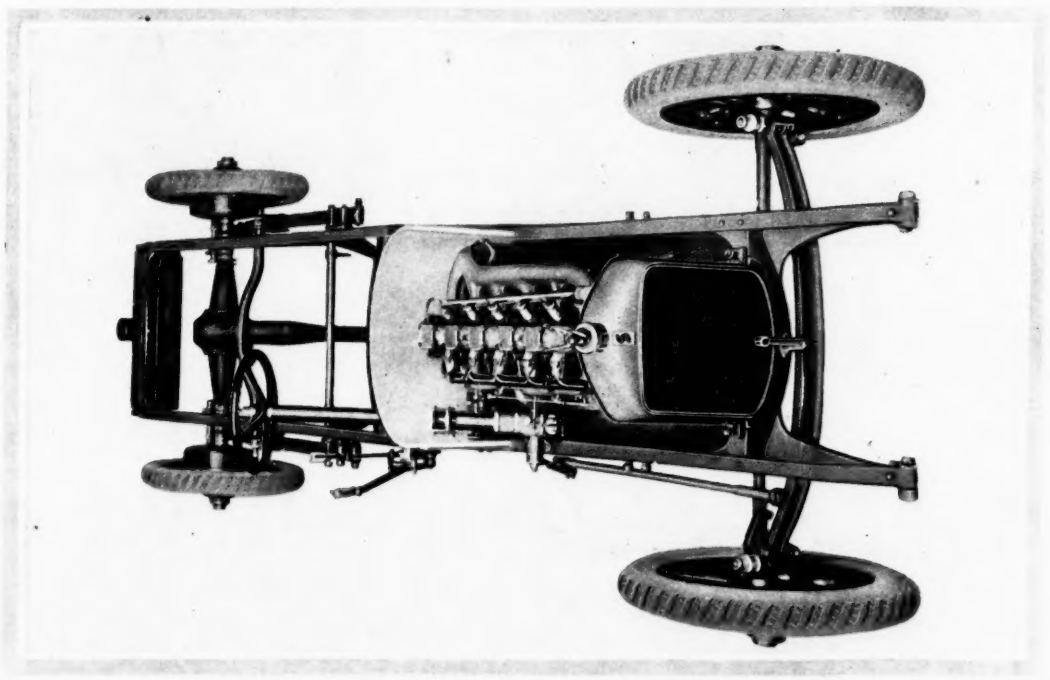
The engine is of the four-cylinder type, 95-mm. bore by 160-mm. stroke. The cylinders are cast monobloc, thus ensuring great rigidity to the whole mechanism, and especially to the crank-case. The five-bearing crank-shaft, which is fitted with balance weights, is constructed of a special quality of nickel-chrome steel with unusually large bearing surfaces. The body of the shaft and the crank-pins are hollow, and are utilised for conveying the oil under pressure to the main bearings and crank-pins. The pistons are constructed from a special aluminium alloy, and are unusually long, giving ample bearing surface in the cylinder, and are fitted with three rings above the gudgeon-pin. The cylinders are placed désaxe, with the object of more nearly equalising the side thrust of the pistons against the cylinder walls. As already stated, the lubrication is of the "forced" type, the submerged type of rotary pump being operated from the cam-shaft by skew-gears.

The petrol supply is from a rear tank of 22-gallons capacity, the petrol being lifted by a vacuum system to a 1½-gallon tank which is carried on the inclined dash under the bonnet.

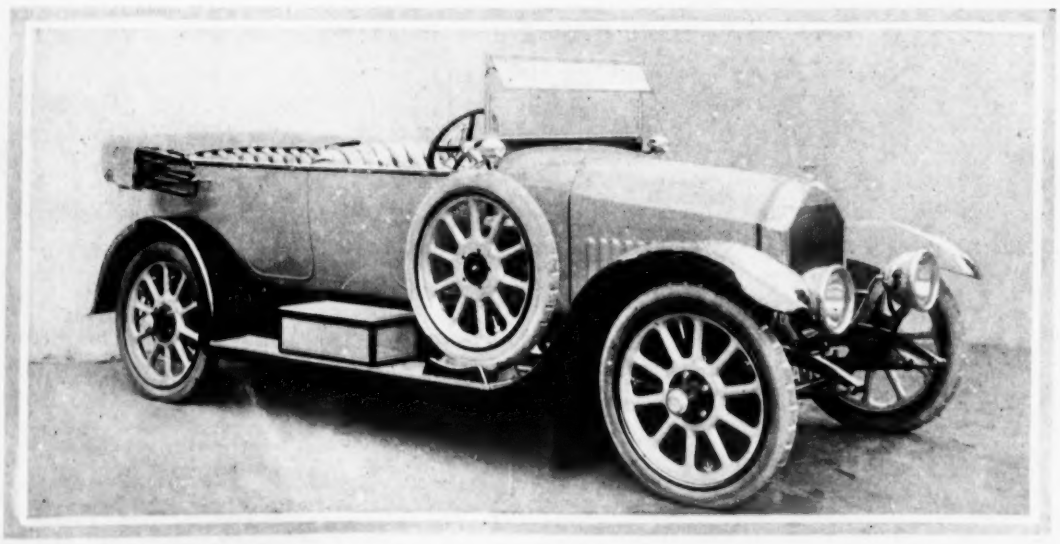
The lighting and starting sets are independent of each other. The starter is entirely enclosed, and engages with a special steel gear ring bolted to the flywheel and forming part of it. This ring is entirely enclosed together with the flywheel and clutch in an aluminium case. The ignition is by high tension magneto. The magneto is driven through the dynamo on the near side of the engine, and this in turn is operated by helical steel and bronze pinions. A special but simple fixing is arranged for holding the dynamo and magneto in place, enabling either or both of these fittings to be removed and replaced with the minimum of trouble. The front of the radiator is made slightly angular, with a narrow flat panel in the centre, thus improving the dignity of the appearance of the car as a whole.

All lamps are independently controlled and a dimming-switch is provided to reduce the glare of headlights when driving in town. To sum up the chassis as a whole, it is essentially a chassis de luxe. The whole car has been designed as a perfect engineering job, but the hand of the artist has also been at work to harmonise the lines of the chassis, so that the coach-building department can follow up with their body lines and make a perfect *tout ensemble*.

Coventry Humbers. The Humber exhibit, at Stand No. 88, consists of a 15·9-h.p. chassis, a five-seated car of the same type and rating, a 10-h.p. four-seater, and a 10-h.p. coupé. The popular 10-h.p. two-seater does not figure at the Show. All the models have been subjected to much in the way of detail improvement over the similar types produced by Humbers before the war, and are all of them equipped with electric engine-starters and lighting. All the 10-h.p. models have the Lucas equipment, while the 15·9 has the C.A.V. outfit. The latter car is an especially handsome vehicle, with saloon body, painted in "Jefferson blue" and black. The 10-h.p. coupé is an equally taking little vehicle, finished in the same colour, and neatly upholstered in Bedford cord. One generally looks to Humbers for an exhibit worthy of their fame, and they have certainly not disappointed us this year. They have not made any startling changes from their pre-war practice; but, as I have already remarked, there is an all-round improvement to be seen that speaks well for the progressiveness of the firm. All the models should command a wide circle of popularity.



THE STRAKER-SQUIRE SIX-CYLINDER, 20-25 H.P.: THE CHASSIS IN PLAN.



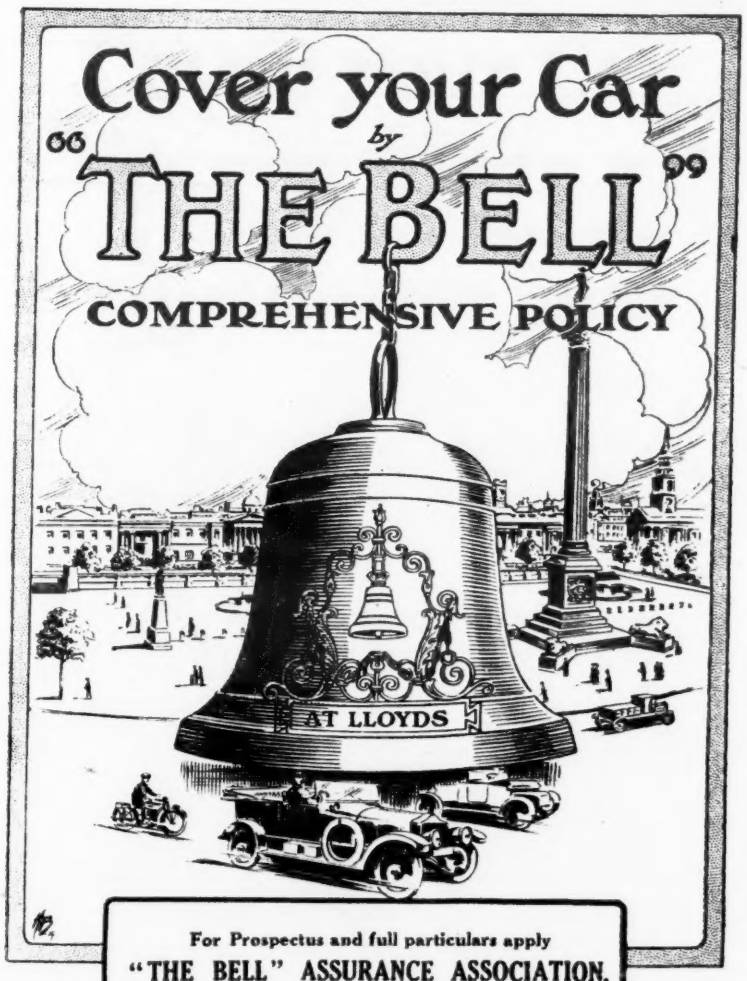
A FIVE-SEATER, 15·9 H.P.: A POST-WAR HUMBER.

A Straker-Squire "Six." For years before the war Messrs. Straker-Squire had pursued the policy of concentration on a single model—the "Fifteen"—which had attained a considerable reputation as a fast and thoroughly reliable car. Their post-war programme does not differ, in that they still intend to pursue the same policy of concentration, and no one is likely to question the wisdom of their decision. The new car, however, represents a complete departure from previous practice. With the experience gained in connection with aero-engine practice, it has become possible for the company to produce a car altogether more efficient and lightened in construction than was conceivable in pre-war days. So marked has been the progress made that the new Straker-Squire has a motor whose six cylinders, with a bore and stroke of 80 by 130 mm., whose Treasury rating is 23·9-h.p., develop no less than 70-b.h.p. on test. It is an interesting engine too, with several noteworthy points of design. In the first place, each of the six cylinders is a separate casting, instead of the more fashionable mono-bloc or pairs of three. It is claimed for this method of manufacture that it is possible to secure more uniform thickness of cylinder walls, and also that the motor is easier to clean single-handed—which latter is undoubtedly the case. Then overhead valves are employed, with vertical shaft-drive through spiral gears to an overhead cam-shaft. The spiral wheel on the crank-shaft is also employed to drive the water-pump, magneto, and electric generator. The intermediate pinion drives the oil-pump. Aluminium alloy pistons are used, suitably webbed, and fitted with four cast-iron rings, the lower being a "scraper."

Lubrication is provided by means of a spur type oil-pump attached to the top half of the crank-case. There is a special relief valve, adjustable from outside, with a return pipe through which all the oil passing through the relief valve goes to the timing gears. Lucas starting and lighting equipment is provided, the starter being built into the crank-case, to which it is secured by straps. The weight of the motor, complete with all its accessories, including starter and dynamo, is only 497 lb. The gear-box affords four forward speeds and reverse, the changes being effected through a lever working in a gate of conventional pattern. Power is taken from engine to road wheels through a single plate clutch, with ring-type coupling between clutch and gear-box, and thence through an enclosed propeller-shaft, universally jointed at both ends, to the bevel-driven rear-axle. All four brakes are on the rear axle, and are of the internal-expanding type. Suspension is by semi-elliptic springs in front, the rear springs being of the cantilever type, of ample length and section. Houdaille hydraulic shock-absorbers are fitted to both front and rear springs.

From this brief description it will be gathered that the post-war Straker-Squire is likely to enhance the already high reputation enjoyed by its makers, and there will be many who knew and liked the old "Fifteen" who will look forward with interest to seeing the new model at the Show.

A Fine Fiat. Why it should be I do not profess to know, but the Italian automobile engineer seems to have the knack of embodying extreme simplicity combined with artistic symmetry in his designs.



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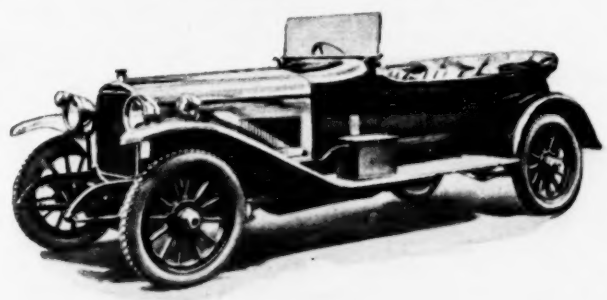

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Set of Dunlop tyres, spare wheel and tyre, dome wings, electric lighting set, self-starter, metal valances, hood and hood envelope (for open car), number plates, clock, speedometer and full kit of tools.

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WHEN a dainty representative of womanhood makes this appeal with a winsomeness that renders denial impossible, she can always furnish conclusive reasons for her request. In the case of a Sizaire-Berwick Automobile, which is an admitted favourite with the fair sex, they are as follows:

THE DIGNITY and grace of its contour is a fitting setting to her charming self.

THE POWER of the engine is under such perfect control that she does not feel afraid of it.

THE RELIABILITY of every part is subjected to such severe tests before leaving the factory at Park Royal that she has complete faith in the car as a whole.

THE LOWNESS of running-cost, and the fact that the Sizaire-Berwick is completely equipped and ready for running before it passes into her hands, appeals to her on the score of practical economy.

And the best is always the cheapest in the long run.

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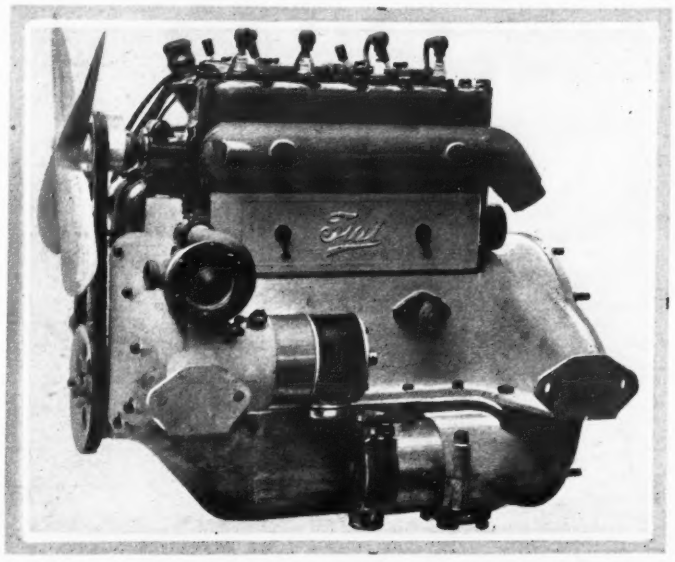
The result is always a beautifully "clean" motor and a chassis free from complications, but sturdy withal. The famous Fiat firm has had as much experience of war automobilism, if I may be allowed thus to put it, as any motor-manufacturing firm among the Allies, and much of it has been done under the extremely strenuous conditions of Alpine warfare. It would be strange, therefore, if the lessons of that experience had not led to an all-round improvement in the cars of the mark which has made Turin famous as a motor-manufacturing centre. The anticipated improvements are there, but they are generally of a character which is not visible to the casual observer, and consist more in refinement of detail than in fundamental alterations in design. The main feature of the exhibit at Olympia is a new 15-20-h.p. car, which made its début at the recent Paris Salon. This, I imagine, will prove a most popular type among those British motorists—and they are not a few—who pin their faith to Fiat and its works. It falls in what may be described as the intermediate class—that one which can be equally adapted to the purposes of the touring car or the town carriage. In its main features of design it conforms to another new Fiat model—the six-cylinder "thirty"—and has a motor of the same dimensions—viz., 75-by-130 mm. Engine and gear-box are a unit construction and are mounted in the chassis frame by a four-point attachment. An inspection of the engine-unit will disclose one of the points of clean design to which I have already referred. The electric starter and lighting dynamo are built into the motor on the valve side in such a way that they do not interfere in the slightest with the accessibility of the valves or other functioning parts of the motor.

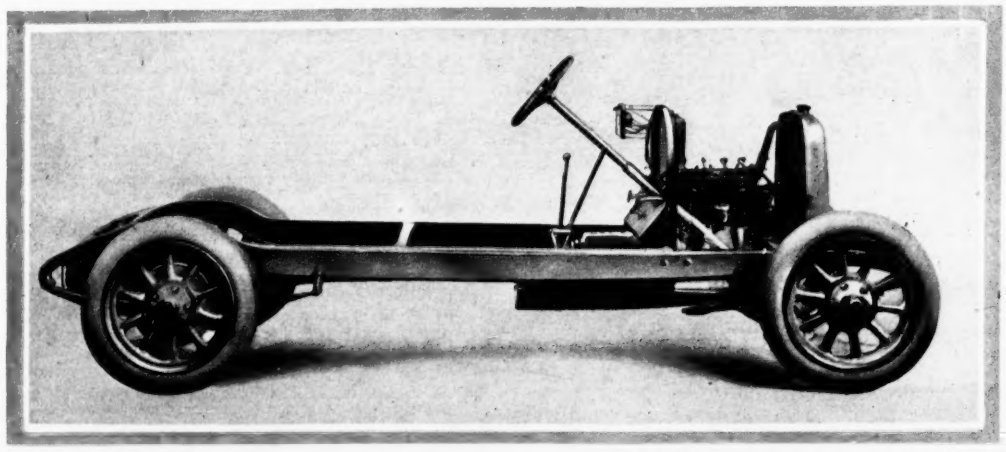


SHOWING THE DISPOSITION OF STARTER AND LIGHTING DYNAMO: THE VALVE SIDE OF THE 15-20-H.P. FIAT ENGINE.

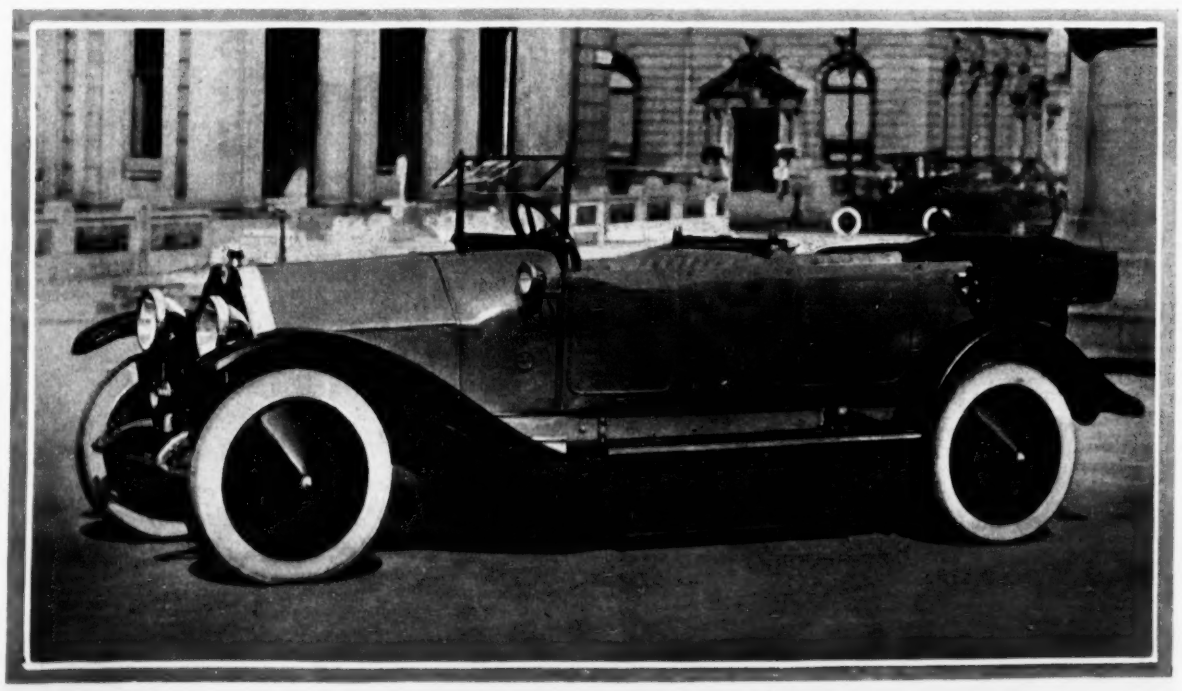
The Fiat engineers have retained the cross-shaft for driving pump and magneto, and cooling is assisted by a cast aluminium belt-driven fan. An entirely new carburetter is employed, this being mounted on the right-hand side of the engine and drawing its air from the valve stem chamber. The inlet to this chamber is now on the rear of the block casting, and is fitted with a butterfly valve, so that all the air can be shut off to facilitate starting from cold. The multiple disc clutch is contained in a housing bolted to the rear of the engine casting. This housing, which is a single casting with no horizontal joint, is divided internally into three compartments, the front one containing the clutch, the second the gears, and the rear one the universal joint and the brake-control mechanism. The rear action has been modified. The two steel stampings of which the axle and the propeller-shaft housing are formed are welded together, and at the rear of the differential housing there is a detachable cover-plate through which the whole of the differential and the crown bevel-wheel can be withdrawn without taking down the entire axle. The petrol-tank is at the rear and is under pressure by means of an air-pump driven from the engine. No hand-pump is required, however, for the petrol is carried to a small supplementary tank fitted with a float-and-needle valve, on the front face of the dash-board, from which it flows by gravity to the carburetter.

All modern accessories are provided with this car. They comprise a speed indicator driven off the propeller-shaft; detachable steel-spoke wheels; electric horn and electric lights, etc. The car is equipped with 820-by-120 mm. tyres, which is a very liberal dimension for a car of this size and weight. The wheel-base is 10 ft., and the track 55 in. The length available for the body is 8 ft. 8 in.

This seems to be quite a notable car and one which should make a strong bid for popularity. Incidentally, I am rather disappointed that the Fiat firm does not seem to be quite ready with the small model which was promised early in the year. I should say that a 10-h.p. Fiat, provided the price was fixed within the class limits, would have been a very interesting little car indeed. Perhaps we shall see it before long, however. Still, even without this anticipated novelty, the exhibit is one that will attract the visitor, and the student of clean design will do well not to miss it.



REMARKABLE FOR ITS CLEAN DESIGN: THE 15-20-H.P. FIAT CHASSIS.



WITH MAYTHORN BODY: A FINE LANCIA TOURING CAR.

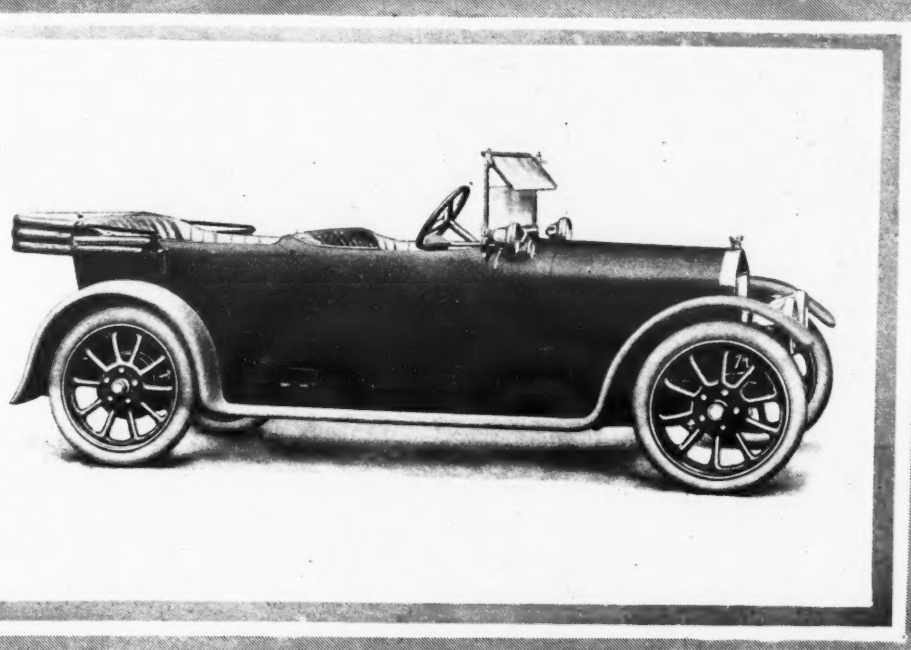
Carburetters at Hobson's.

Whether for racing or for ordinary use on the touring car or town carriage, the Claudel-Hobson carburetter has achieved a well-deserved popularity. For sustained power and acceleration it is certainly one of the best available devices of its kind, while it is equally good for slow running. Such a combination of qualities stamps it as a good thing, and that these qualities are recognised is witnessed by its record in peace and war. I suppose it holds more racing records, both on road and track, than any other, and its performances in the air have been equally good. Every type is shown at Stand 207 in the gallery, and will interest the motorist who is, perchance, not quite convinced that he is getting the best results from his motor. Incidentally, very few of us are, now that fuel is of the uniformly poor quality ruling, which is all the more reason why a really efficient carburetting device should be of more than passing interest. The types shown may as well be detailed, in order that the inquirer may know exactly what is likely to suit his needs. They include Type HCS for motor-cycles. This is a new design to meet the demand for efficient single-lever carburetters for this class of work. Type MIA is a vertical carburetter for light cars and small stationary engines. Type HC4: a new horizontal model for light car and small stationary engines. Standard Type AC: this is a most simple, economical, and efficient carburetter and is therefore eminently suitable for lorry, commercial, marine and tractor engines. Type MZ: this type is fitted with a diffuser, giving a finer range of adjustment, and is specially designed for touring and racing where maximum results are desired. Types HC2 and HC12: these are new models, designed on the same principle as the "Z," but fitted with an additional petrol control.

There are also larger models shown, such as BZS and CZS, for racing cars, and types HC7 and HC8 for aviation engines. Owing to the absence of any road racing during the last five years, records achieved with the aid of the Claudel-Hobson carburetters have been principally confined to aviation. Prior to the time of the Armistice, all records for speed, height, rate of climb, lifting and distance were made by aeroplanes whose engines were fitted with Claudel-Hobson carburetters, and since that time further records have been made, the most notable being Capt. Sir John Alcock's direct Trans-Atlantic flight (Rolls-Royce engines); H.M. Airship *R* 34, direct Transatlantic flight (Sunbeam engines); London-Paris record (Rolls-Royce engine); London-Madrid record (Napier Lion engine); Aerial Derby, 1st, 2nd, and 3rd (Napier and Rolls-Royce engines).

All these engines were fitted with Claudel-Hobson carburetters.

Messrs. Hobson are also exhibiting the "Perfect" window regulator. This device is for raising and lowering the windows of closed cars by means of a rotating handle replacing the old-fashioned and awkward method of strap and button. A demonstration regulator can be seen on the stand. This regulator has been used to a considerable extent in the United States during the last five years, and is a standard fitting on many of the best American cars, such as Peerless, Packard, Pierce-Arrow, etc.



The "WOLSELEY" FIFTEEN Touring-Car

"WOLSELEY"

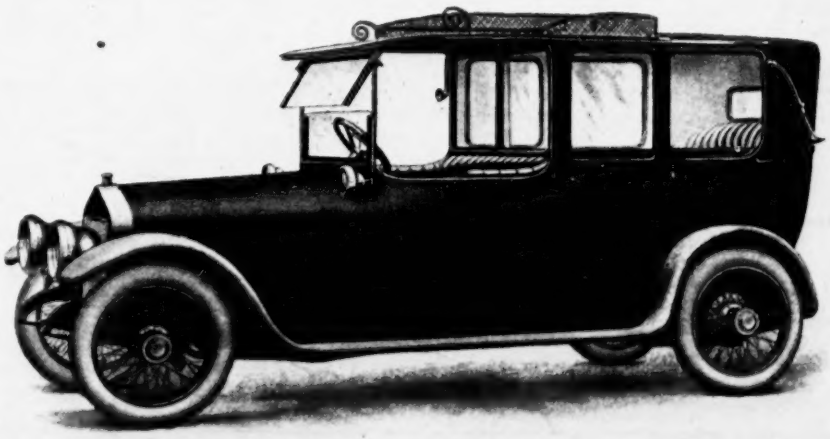
The new "WOLSELEY" models constitute a complete range of modern motor carriages for every purpose, fully equipped and ready for the road.

The "WOLSELEY" TEN (formerly "Stellite").
The "WOLSELEY" FIFTEEN (four-cylinder).
The "WOLSELEY" TWENTY (six-cylinder).

STAND No. 84, OLYMPIA

WOLSELEY MOTORS, LTD. (Proprietors: VICKERS LTD.) **BIRMINGHAM.**

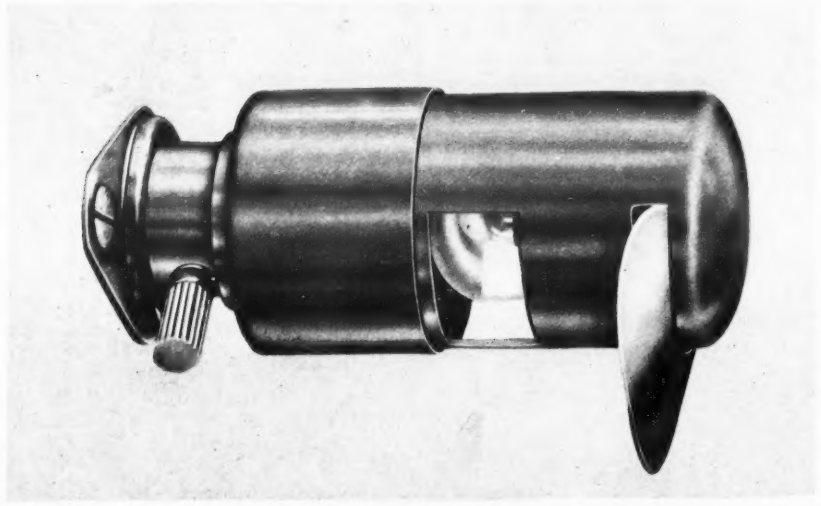
The "WOLSELEY" TWENTY Landaulette



Sunbeams at No. 49.

One of the fortunate firms who were kept to their own work of car manufacture during the war is Sunbeams, who are showing specimens of the 16-h.p., four-cylinder and 24-h.p., six-cylinder cars of their mark. Except in detail, these cars do not appear to have been materially altered. Having regard to the success of Sunbeams in the matter of aero-engines, I should have expected to see more indications of change in accord with experience gained along those lines of engineering practice than is observable in these new models. That is not at all in detraction either of policy or the resultant cars. I have a very open mind as to the adoption of aero practice in car design, and when a firm like Sunbeams, with all the accumulated experience of years of racing success and with a high reputation for turning out cars of superlatively good quality, tacitly say that they see no advantage in changing the basic design of their engines, I am certainly not going to be so rash as to question the wisdom of their decision. Among the changes to be noticed is that the vacuum system of fuel-feed has been adopted, and in the case of the "sixteen," the carburetter is the well-known Claudel-Hobson, while in the larger car it is the S.U. Sunbeams, too, are another firm who pin their faith to forced water circulation, a pump being installed in both models. The steering has been re-designed and improved, with the object of giving a light, sensitive steering with no backlash. Change-speed and brake-levers are retained at the right-hand side of the car, Sunbeams being obviously reluctant to follow the lead of a good many who are mounting these levers centrally.

The complete exhibit consists of a 24-h.p. saloon, with a very handsome stream-line body, totally enclosed and affording ample accommodation for four people. The large plate-glass windows are frameless and noiseless in operation, being made to slide in velvet lined grooves. It is luxuriously upholstered in Bedford cord, with curtains, electric interior lighting and all usual fittings. Another car is a 24-h.p. sporting type of open car. This has a very smart low-hung body, tapering slightly inwards from the centre. The bonnet is of polished aluminium, tapering gradually into the dash and bodywork, the whole being of true streamline form. It has seating accommodation for four—two in front and behind respectively. Attractively finished and upholstered, this is a very taking car. Lastly there is a 16-h.p. touring car, with a roomy four-seated body. Altogether, the Sunbeam exhibit is a very attractive one, and will no doubt command a great deal of attention during Show Week.



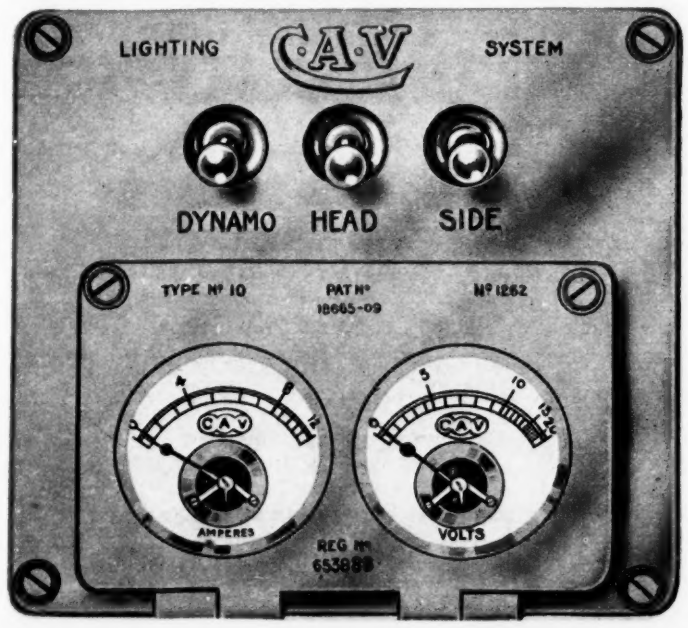
BY C.A.V.: A NEW TYPE OF ELECTRIC DASH-LAMP.

C.A.V. Electricalities.

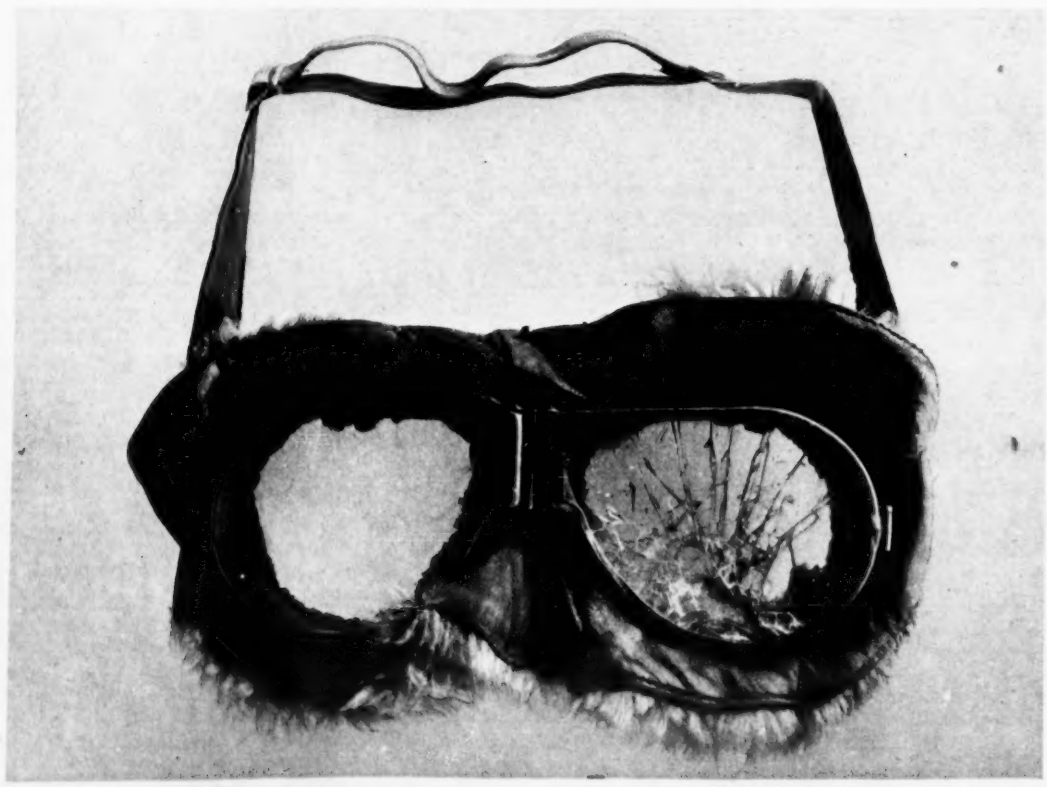
Nowadays no car is a car without its equipment of electric light generated by its own self-contained dynamo set, and in few modern vehicles is the addition of the electric engine-starter wanting to complete the *ensemble*. Thus it is that such exhibits as that of Messrs. C. A. Vandervell become of increasing interest every year. They were virtually the pioneers of electric car-lighting in this country, and their products have, ever since the quite early days of automobilism, borne the hall-mark of sound design and conscientious workmanship. The motorist whose car is equipped by C.A.V. is safe in the knowledge that he can do no better. On the stand occupied by this well-known firm the visitor can inspect all that is latest and best in electrical equipment and devices, from the newest type of self-starter and lighting dynamo to cunningly devised dash-lamps for illuminating the instrument-board without interfering with the view of the road by driver or passengers. Also he can see all sorts of convenient little fittings which do much to assist in making motoring the easy and pleasant pastime it is to-day, whether he be the owner of the lordly limousine or of the less ambitious light car. Thanks to the enterprise and foresight of firms like C.A.V., there is no reason in the world why the motorist whose means restrict him to the use of the smaller class of car should not be to the full as well equipped electrically as the largest of automobile saloons. Not only can he have electricity at his call for head, side, and tail lights, but he can fit up his car with interior lighting at quite a moderate cost, and attach all those little fittings, such as electric cigar-lighters and inspection-lamps, which were, not a long time ago, the monopoly of the large and expensive vehicle. It is obviously impossible to review in detail all the good things that are to be seen here—in any case, everything will not appeal to everybody—but this is an exhibit which must not be missed.

Motor Clothing at Nicoll's.

The house of H. J. Nicoll and Co., Ltd., exhibiting at Stand No. 247, is an establishment which, although historic in its antiquity, yet pursues a policy that is nothing if not up to date in every respect. The dominating note struck by Nicoll tailoring has always been that of inherent refinement and distinction in combination with the maximum of practical utility. To say that the needs of the motorist have been especially studied is to state the obvious, for it would be altogether impossible to imagine anything more desirable, correct, or more thoroughly workmanlike than the famous Nicoll Anti-Borean wind and weather-proof motor coat, to mention only one of the many distinctive models Nicolls are displaying. Whether expressed in fur, tweed, frieze, or other of their special warmth-providing fabrics, lined or trimmed with fur or provided with detachable linings of fleece or leather, Nicoll car coats provide not only that comforting warmth and protection essential to the full enjoyment of motoring, but at the same time exhibit in every line that exclusiveness of design, workmanship, and material which are characteristic of this notable house.



THE LATEST TYPE: A NEW C.A.V. SWITCHBOARD AND INSTRUMENTS.



AFTER A HEAVY BLOW! A PAIR OF TRIPLEX SAFETY-GLASS GOGGLES.

Parsons' New Things.

Besides showing on Stand No. 303 some of the well-known Parsons non-skid chains, this firm are placing before the public two distinct novelties, in the Parsons spare-wheel carrier and the Parsons chain-jack. The Parsons non-skid chains are shown in different models for pneumatic and solid tyres—the latter for either single or twin wheels. It is claimed that the Parsons chains are indispensable to every motorist who wishes to drive on every possible condition of road surface or where roads do not exist. On solid tyres many thousands of Parsons chains have been used during the war on all kinds of vehicles—lorries, gun-carriages, tractors, etc. The Parsons spare-wheel carrier consists of a pair of metal brackets with hinged arms to be fastened to the foot-board, and so designed as to remove any possibility of damage being done to the tyres of the spare wheel by rubbing. The wheel is held in position by a firm grip on the rim, which is secured by one turn of a locking lever, the arms of the bracket encircling the tyre with ample clearance to avoid touching at any point. The carrier is equally suitable for a "dished" or flat foot-board, as the rim can be firmly gripped at any point by regulating the distance between the bracket standards when fixing them on to the foot-board. As the arms of the bracket do not pass between the spokes, the carrier is equally suitable for wooden, wire, or disc wheels.

The Parsons chain-jack is operated by a chain instead of by the more usual tommy bar. This enables the operator to assume a more comfortable position when once the jack has been put into place, so that the job is much cleaner and less exhausting than with the usual type of jack. It also has an extension head hinged on to the head proper for use with extra high axles. To operate a Parsons chain-jack it is not necessary to get down in a cramped position

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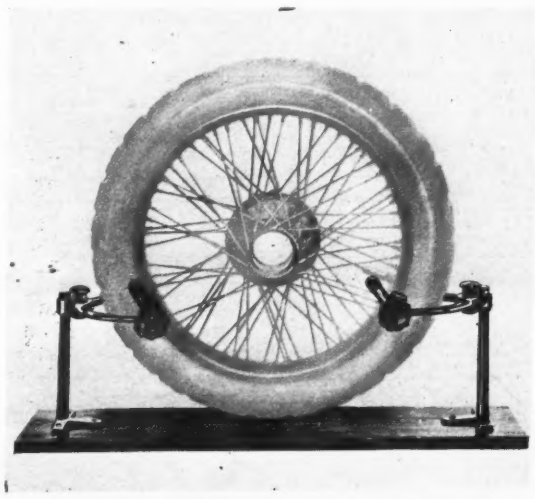
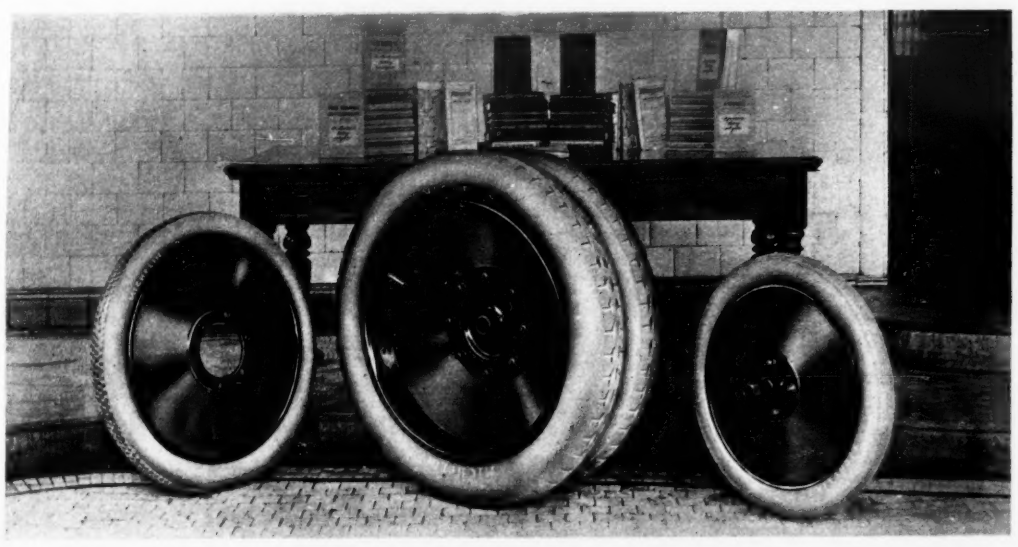
and grovel in mud and grease under a car to work a handle that is apt to fly up with unpleasant results. To lift a car, you simply give a few pulls on the chain, while you stand clear away from springs, tyre-carriers, and other projections. To lower the car, you pull the chain in the opposite direction.

Michelin Tyres. On the Michelin stand there is the usual exhibit of the whole of their manufactures, including the well-known Square Tread, "Semelle" Nonskid, and "All Purposes" tyre. Among the accessories on the stand are shown the Michelin jack, Michelin pressure-tester—a new pattern—and the Michelin air-cylinder. To the public, however, the main feature of the stand is undoubtedly the new Michelin disc-wheel—a plain steel disc-wheel, detachable at the hub. In addition to the wheel, hubs for artillery and wire wheels, showing alterations necessary for use with the disc-wheel, are shown. Demonstrations are given of tyre fitting and detaching with Michelin wheels. These demonstrations show the extreme simplicity and rapidity of the fitting of Michelin tyres by a minimum of physical effort, and without danger of nipping or puncturing the tube, the cover and tube being fitted at one and the same time. In addition, the Michelin Tyre Company, Ltd., exhibit the following publications: Guides to the Battlefields of France, both in French and English; a full range of their guide-books for Great Britain, France, Spain, Belgium, and the "Sunny Countries"; maps of the British Isles; and maps of France. Altogether, the Michelin exhibit is a most interesting one.



DESIGNED TO AVOID TYRE CHAFE: THE PARSONS SPARE-WHEEL CARRIER.



AT OLYMPIA: MICHELIN TYRES AND ACCESSORIES.

The Angus-Sanderson. Probably no car has ever caused quite the sensation on its announcement as the Angus-Sanderson. Mass production was a thing unknown in the British motor trade before the war—at least on the lines made familiar by American methods—and when it was stated that Messrs. Angus-Sanderson intended to apply those methods to the production of a really good-class car at a moderate price, its advent was regarded with what has amounted to feverish anticipation. Difficulties of one sort and another have prevented deliveries as the firm hoped to make them, but I am able to say—I have one of these cars on order myself—that it has been no fault of the makers. However, it is to be hoped that all these difficulties have now been overcome, and that we shall soon see this really excellent car in being on the roads in quite large numbers. For I am able to say, of personal knowledge, that it is in fact a very fine car indeed—so good that it is a mystery how, in these days of high costs of labour and material, it can be made and sold at the price it is, viz., £450. Very few people have been privileged to see a new Angus-Sanderson as yet, and the motorist has had to take it on the faith of its specification. Truth to tell, this is good enough for anyone. The engine is a Tylor, and there are few firms of engine specialists who know as much about the internal-combustion motor as Tylors'. The gear-box, rear axle, and transmission are made by Wrigleys, a firm which has absolutely nothing more to learn about current practice in the direction of its own special work. All the electrical equipment is supplied by Messrs. Lucas—which is to say that nothing better can be purchased. Wheels are made by Goodyears—another firm with years of specialist reputation behind. Then, as to body-work, Messrs. Angus-Sanderson themselves have been famous for years for their coach-building. Their experience in wood-working was turned to good account during the war in the building of aeroplanes; and it was while engaged on this task that a system of quantity production was evolved which was afterwards taken as the pattern for the whole industry. They are now able, therefore, to bring to bear on their own specialist part of the production of the car a great deal of valuable experience to help out their expert knowledge of coach-building. Having regard to all

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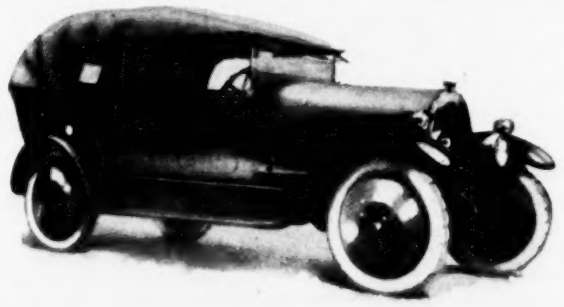

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Streamline body, with concealed hood; sliding front seats. Electric lighting and starting outfit. Pressed steel disc detachable wheels. The Marles Steering Gear.

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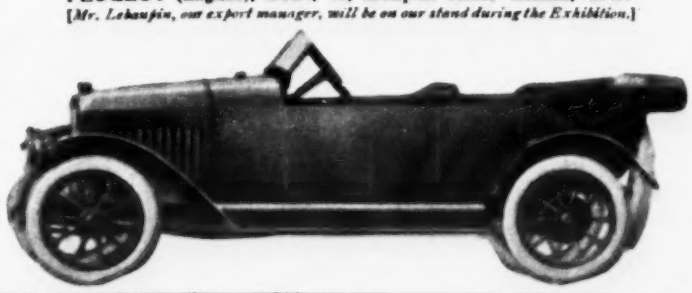
[*Mr. Lebaupin, our export manager, will be on our stand during the Exhibition.*]



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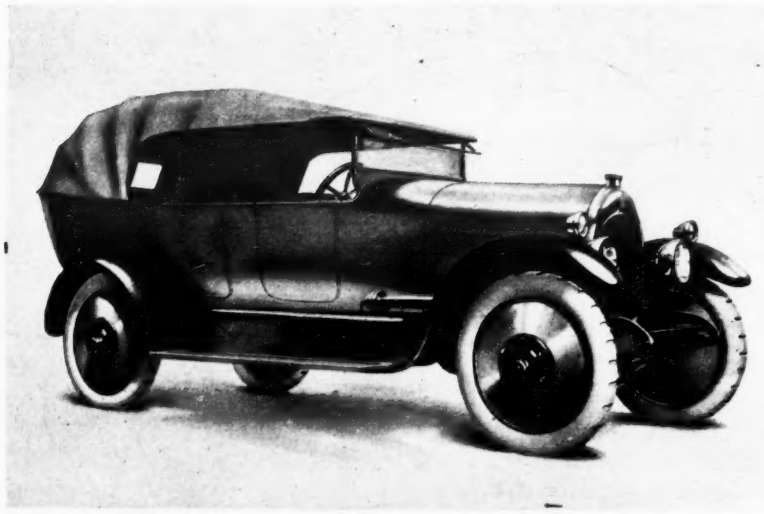
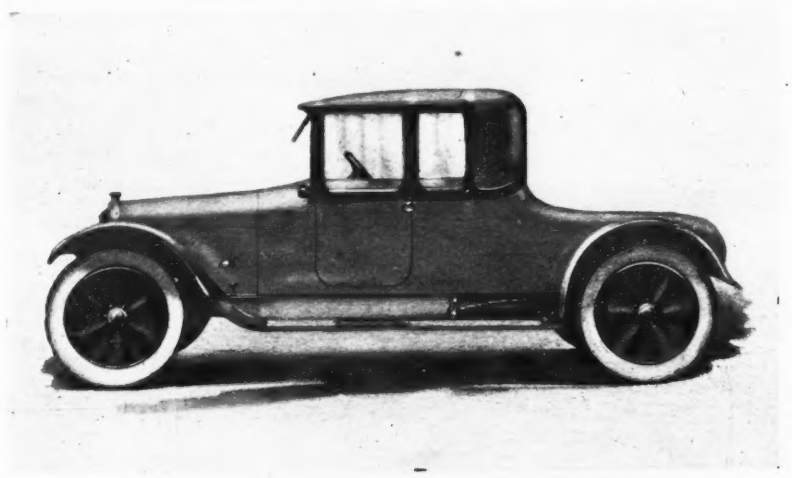
these facts, I think I have said a perfectly safe thing in laying it down that the new car is good enough to accept on its specification alone. As a matter of fact, I am by no means alone in that judgement, for I know that immediately upon the announcement made early in the year, quite a number of people who figure among the experts ordered them for their own use, long before the first demonstration cars were on the road. I imagine that during Show Week all Olympian gangways will lead to the Angus-Sanderson stand. Three complete cars of the new model are shown. These are a four-seater open touring car, a four-seated coupé, and a two-seated coupé. It is rather a pity that considerations of space have precluded the exhibition of a chassis, which would have been of surpassing interest to the visitor.

A New "Mass Production" Car.

There is not a doubt that if this country desires to meet American competition on level terms, our motor manufacturers will have to pay more attention to mass production methods than they have hitherto done. The high prices has gone for ever. Fortunately, the realisation of this seems to have sunk home in more than one direction, and we hear of quite a number of firms who are determined to go for productions more approximating to those of American factories than to those of the pre-war period. It is the only way, in view of the vastly increased cost of labour and materials, that we shall get back to anywhere near the price level of 1914. Among the people who purpose putting on the market a car built on mass production lines are Messrs. Ruston, Hornsby and Co., the well-known engineers of Lincoln. They are exhibiting a car which has a great many features of interest. It seems to have been designed throughout with an eye to the avoidance of everything in the shape of complication and for reduction of the number of parts employed. Steel pressings and stampings are very largely used, and figure in quite unexpected places. For example, the clutch, wheels, radiator shell, dash and body panels are all pressings. There are many interesting features of design, and a more or less detailed description of the chassis may be useful to the Olympian visitor.



A NEW MASS-PRODUCTION CAR: THE RUSTON-HORNSBY.



AS A TWO-SEATED COUPÉ: THE ANGUS-SANDERSON.

The frame is of simple design, the main members being straight throughout their length. Four pressed and two tubular cross members are fitted, one of the latter being placed between the dumb irons. For the engine, three-point suspension is used, the front is carried in a circular housing surrounding the starting-handle bracket and resting on the front pressed cross members, while the rear end is supported by two arms bolted directly to platforms on the second cross member. The third, or main, cross member carries the brackets for the change-speed control, brake and clutch pedals, and the attachment for the front end of the torque tube. Semi-elliptic front springs and three-quarter elliptic rear springs are fitted to the chassis. The latter are exceptionally long and have swinging shackles at both ends. For the front axle a solid steel stamping of heavy "L" section is used, and the swivel pins are fixed in the outer ends of this, while the stub-axles are of the jaw pattern fitted with phosphor-bronze bushes.

The steering-gear is of patented design, and differs from standard types in that movement of the cross-shaft is obtained through the action of the two cams. These are of snail pattern cut from the solid and keyed to the main shaft. Rotation of the steering-wheel increases the lift and angle of one cam and decreases the lift and angle of the other. This action is transmitted to the drop-arm by two ball-races on the steering-box cross-shaft. Backlash is practically eliminated, and the amount of wear is negligible owing to all pressure being taken by hardened cams and ball-races. It is claimed that the steering is more expensive, high-grade cars can hold their own with comparative ease, but when we come to the more popular types I think it may be said, with something approaching certainty, that the day of limited outputs and relatively

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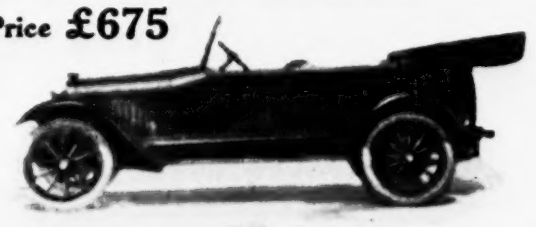

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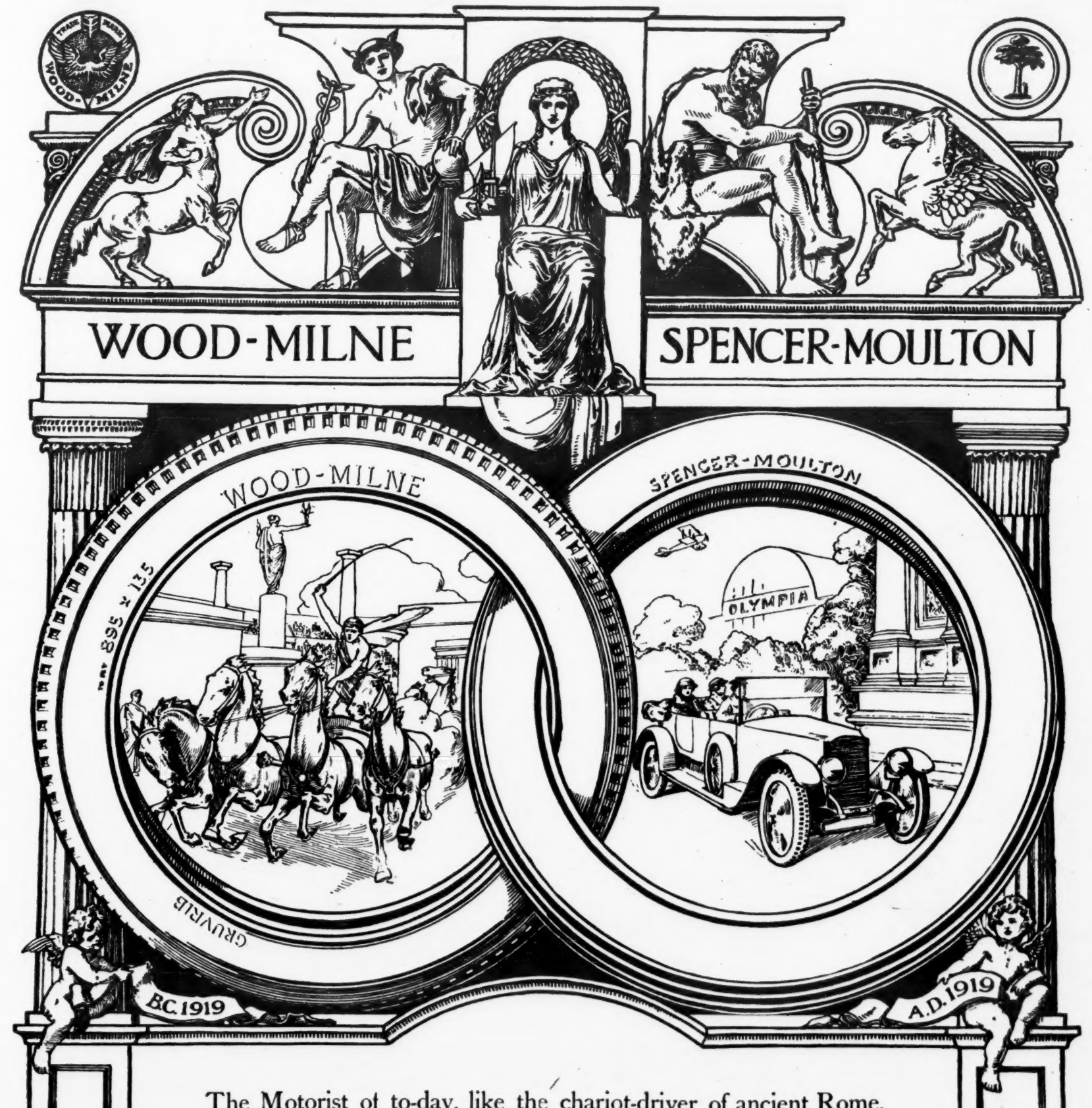

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particularly stable, easy to handle, and not sensitive to road shocks.

The motor is 80-by-130 mm. bore and stroke (15·9-h.p. R.A.C. rating), having the four cylinders and top half of crank cast in one block, and a separate casting for the cylinder heads. The valves are of large diameter, placed on one side, and lifted by adjustable tappets. The pinions driving the cam-shaft and magneto driving-shaft have helical teeth, the one driving the former meshing with a pinion on the front end of the crank-shaft. The pistons have two rings and gudgeon pins located by brass end caps, and the connecting rods are of H section, with phosphor-bronze small end and die-cast big end bearings. The large diameter four-throw crank-shaft is supported in three bearings lined with white metal and located in the top half of the crank-case.

A gear-pump immersed in the sump and driven by a spiral gear from the cam-shaft delivers oil to a filter, and thence to main bearings, timing gears, and troughs underneath the big ends. Splash lubrication is relied upon for the cylinder-walls, and gudgeon-pins and a pressure-indication gauge is provided. Ignition is by a British high-tension magneto bolted to a flanged opening at the back of the timing-case; the drive is taken by a coupling having a means of fine adjustment. The high-tension wires are led up to the sparking-plugs through a neat form of tubular carrier.

A horizontal Zenith carburetter is bolted directly to the offside of the cylinder-block, and is supplied with petrol by gravity from a ten-gallon tank on the metal dash. From this the mixture is led through a passage cast between the two middle cylinders to an induction-pipe connecting to the valve-ports. Cooling is by pump-circulation, the water-pump being placed in front of the timing-case and driven by the same shaft as the magneto. The water is deflected to pass through the cylinder-casting by suitably placed baffles, and reaches the radiator by outlet-pipe and rubber connection. The radiator is of the honeycomb type, having the tube and tank block as a complete unit bolted inside a light pressed-steel casing of distinctive design. Cooling is assisted by an eighteen-inch four-bladed fan placed behind this, and driven from a large pulley on the cam-shaft by a Whittle belt. A second belt drives the C.A.V. lighting dynamo, carried on a bracket bolted to the offside of the crank-case. Another bracket carries the starting motor, which has a pinion meshing with a gear-ring on the engine fly-wheel.

The clutch is of the inverted-cone type made up of two light pressings, the outer one being bolted to the fly-wheel, and the inner one carrying a fabric lining. A single volute spring is used, the tension of which may be varied by means of a split-nut and thrust collar carried on the clutch centre. Adjustment is also provided for the position of the clutch pedal. The gear-box is carried directly off the back-axle casing, the drive being transmitted to it by a tubular propeller-shaft of large diameter. This shaft is spliced at its lower end where it enters the gear-box, and the upper end is coupled to the clutch by a Hardy Canflex disc universal joint. The torque tube has a forked coupling at its upper end free to work on the tube, and attached by trunnion-pins to a bracket on the main cross-member. Three forward speeds and reverse are provided.

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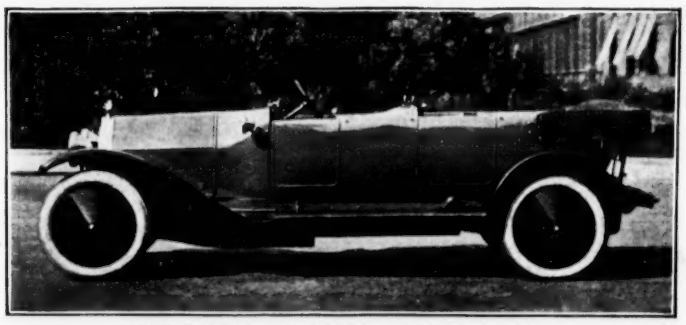

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